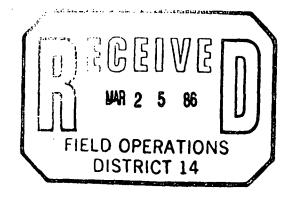


229-025-01

RECOMMENDED GROUNDWATER TREATMENT
AND DISCHARGE PROGRAM FOR THE
100 CONGRESS AVENUE SITE,
AUSTIN, TEXAS



Prepared For:

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March, 1986



Reviewed by

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1.0 INTRODUCTION

Radian Corporation has been retained by Lincoln Property Company (LPC) to provide several technical and engineering support services related to the occurrence of hydrocarbons in the subsurface at the 100 Congress Avenue site, Austin, Texas. At the request of LPC, Radian has analyzed samples of groundwater from the site and has performed laboratory and field treatibility tests on groundwater from the site. The objective of these efforts has been to develop recommendations for appropriate management of groundwater which is being pumped from the excavation at the site.

LPC has coordinated with several state and local agencies regarding the proper management of the groundwater and hydrocarbon material from the site. This report documents the results of chemical analyses and treatibility studies performed on groundwater at the site and presents Radian's recommendations for treatment and monitoring of groundwater from the site.



2.0 GROUND-WATER CONDITIONS AT THE 100 CONGRESS AVENUE SITE

Groundwater at the 100 Congress Avenue site occurs in a thin zone at the base of the alluvium of the Colorado River. The bedrock below the alluvium is Austin Chalk and Eagle Ford Shale. The relationships of the alluvium, bedrock, and groundwater are shown diagramatically in Figures 2-1 and 2-2. There relationships have been established based on reconnaissance field observations and examination of drilling logs rather than detailed mapping.

2.1 Ground-Water Quality

Samples of groundwater were collected from the site and analyzed for priority pollutants and general water quality parameters in July and November 1985, and in February 1986. Samples of the seepage water contaminated with coal tar residues were first obtained from the face of the excavation in July 1985. After its discovery, the contaminated water seeping into the construction site was collected in a 22,000 gallon "FRAC" tank. Subsequent samples collected from the "FRAC" tank in November 1985 and February 1986 were also analyzed for priority pollutants and water quality parameters. (first three columns) provides a summary of the analytical results for the water samples collected over this period. Laboratory analytical data sheets for these analyses are included as Appendix B. The specific organic compounds found are typical at coal tars and include polynuclear aromatic hydrocarbon Table 2-1 (last two columns) also shows the water quality of effluent samples after bench and pilot scale treatment tests were performed The effluent sample analyses are discussed in using carbon filtration. subsequent sections of this report.

As can be seen from Table 2-1, the quality of the ground water has improved since it was discovered seeping into the pit in July 1985 to the point that in February 1986, the organic compounds typical of coal tar residues are no longer present at the limits of analytical detection. The

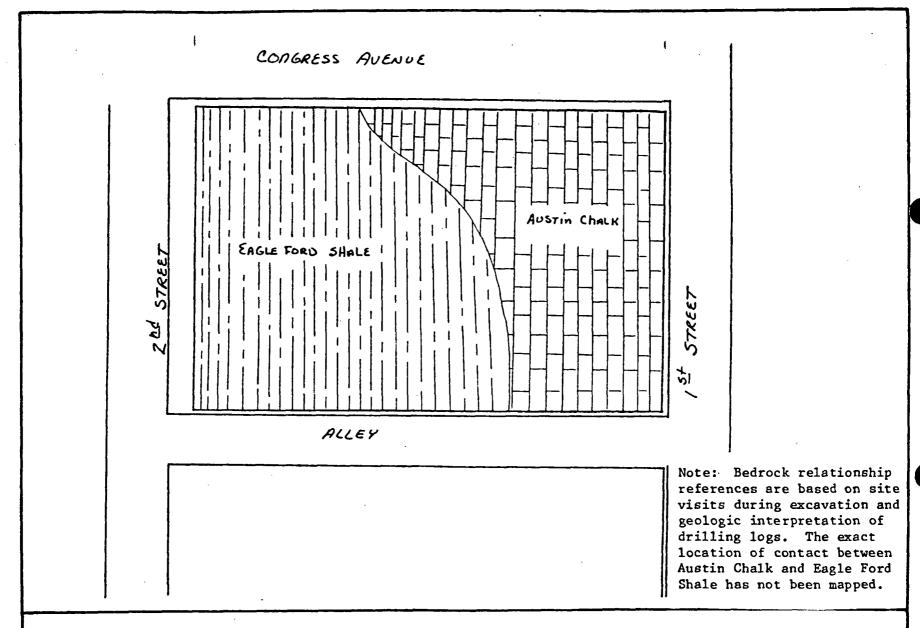


Figure 2-1. Inferred bedrock relationships at the 100 Congress Avenue Site -- Plan View.

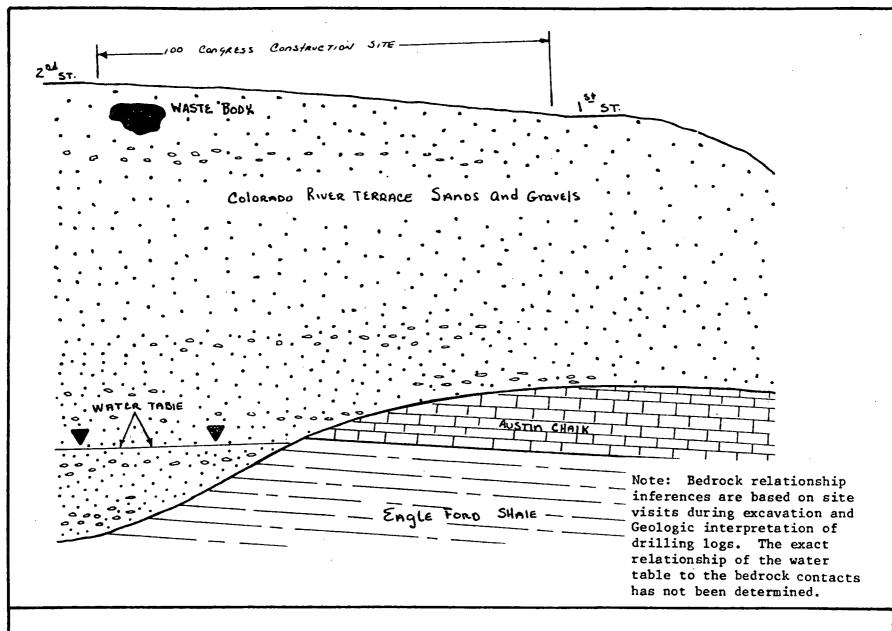


Figure 2-2. Inferred bedrock relationships at the 100 Congress Avenue Site -- Cross Section View.

TABLE 2-1. COMPARISON OF WATER QUALITY OF GROUND WATER AT 100 CONGRESS AVENUE (JULY 1985 TO FEBRUARY 1986) AND AFTER LABORATORY AND FIELD TREATABILITY TESTS

Parameters	From Pit 7/85 (mg/L)	From FRAC Tank 10/85 (mg/L)	From FRAC Tank 2/86 (mg/L)	From Carbon Bed Effluent ¹ 10/85 (mg/L)	From Carbon 2 Bed Effluent 1/86 (mg/L)
Total Volatile Organic Compounds (EPA Method 624)	11.2	0.10	ND	ND	NID
Total Base/Neutral Organic Compounds (EPA Method 625)	56.2	0.05	ND .	N D	ND
Total Acid Fraction Organic Compounds (EPA Method 625A)	ND	ND .	ND	ND	ND
COD	-	110	21	7	15
BOD	_	4	12	1	7
рН	7.3	8.2	8.8	8.2	8.7

¹ 2Bench Scale Test 2Pilot Scale (Field) Test 3ND = Not Detected



substantial reduction in contaminant concentrations is apparently due to two factors: 1) the initial seepage was more contaminated than the seepage which is now appearing in the excavation pit; and 2) the coal tar contaminants are mostly in the form of insoluble tar particles which sink to the bottom of the storage tank and are, therefore, removed by settling. The proposed treatment system for this water is designed to take advantage of these factors.

2.2 Ground-Water Quantity

Seepage water at the 100 Congress Avenue site has been collected and disposed by LPC since it was discovered in early July 1985 by trucking the water off-site to injection wells. The actual records of this contract hauling provide an estimate of the flows that must be handled by the treatment system.

An analysis of these records indicate that the average flow rate into the construction site over the period from 1 August 1985 through 31 January 1986 is approximately 6,100 gallons per day and that daily inflows range from 439 gallons per day to 55,957 gallons per day over this period. A summary of the daily inflow values is shown graphically in Figure 2-3.

Using the data presented in Figure 2-3 it is possible to determine the storage capacity and the treatment rate which is required to store and treat all of the ground-water inflows. One of the most commonly used methods to determine storage requirements is by mass-curve analysis. This method evaluates the cumulative deficiency between inflow (ground-water seepage) and outflow (treatment rate) and selects the maximum cumulative value as the required storage.

The results of this procedure are presented as Table 2-2, which has six columns of data. The first and second are the date and average daily inflow. These data are also shown as Figure 2-3. The third column is the treatment rate in gallons per day. The value of 28,800 gallons per day

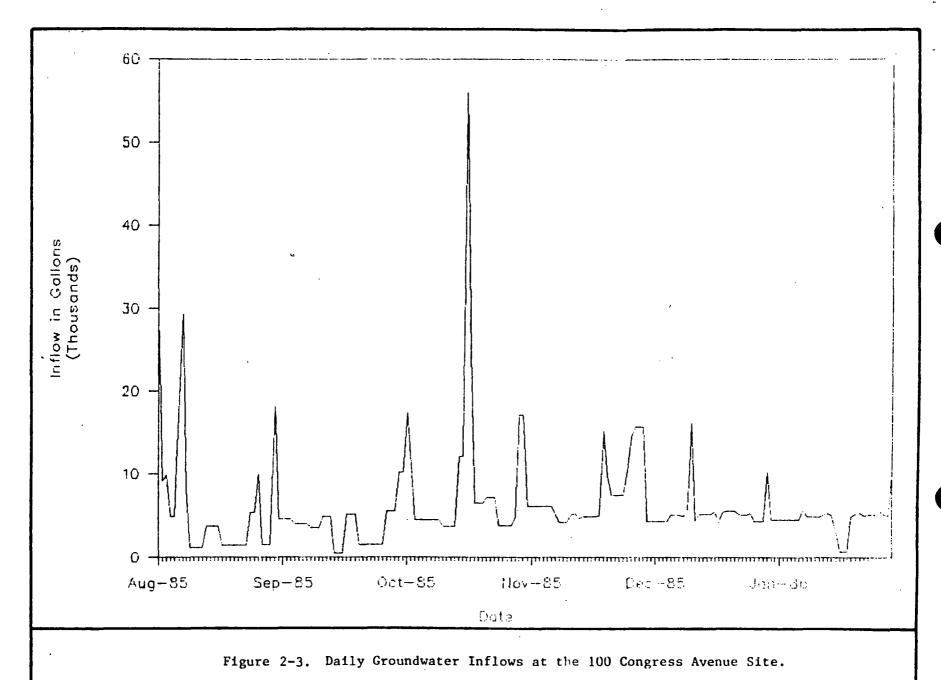




TABLE 2-2. STORAGE REQUIREMENT COMPUTATIONS

	.	Cumulative		_	Volume in
Data	Inflow	Inflow	Outflow	Excess	Storage
Date	(gpd)	(gal)	(gpd)	(gal)	(ga1)
01-Aug-85	28958	28958	28800	158	158
02-Aug-85	9140	38098	28800	-19660	0
03-Aug-85	9847	47945	28800	-18953	0
04-Aug-85	4861	52806	28800	-23939	. 0
05-Aug-85	4861	57667	28800	-23939	0
06-Aug-85	19210	76877	28800	-9590	0
07-Aug-85	29332	106209	28800	532	532
08-Aug-85	8182	114391	28800	-20618	. 0
09-Aug-85	1064	115455	28800	-27737	0
10-Aug-85	1064	116518	28800	-27737	0
11-Aug-85	1064	117582	28800	-27737	. 0
12-Aug-85	1064	118645	28800	-27737	0
13-Aug-85	3722	122367	28800	-25079	0
14-Aug-85	3722	126088	28800	-25079	0
15-Aug-85	3722	129810	28800	-25079	0
16-Aug-85	3722	133531	28800	-25079	. 0
17-Aug-85	1412	134943	28800	-27388	0
18-Aug-85 19-Aug-85	1412 1412	136355	28800	-27388	0
20-Aug-85	1412	137767	28800	-27388	0
21-Aug-85	1412	139180 140592	28800	-27388	0
22-Aug-85	1412	142004	28800 28800	-27388 -27388	0
23-Aug-85	1412	143416	28800	-27388	0 0
24-Aug-85	5278	148694	28800	-23522	0
25-Aug-85	5278	153972	28800	-23522	0
26-Aug-85	9943	163915	28800	-18857	Ö
27-Aug-85	1523	165438	28800	-27277	Ö
28-Aug-85	1523	166962	28800	-27277	Ö
29-Aug-85	1523	168485	28800	-27277	. 0
30-Aug-85	18204	186689	28800	-10596	Ö
31-Aug-85	4556	191245	28800	-24244	0
01-Sep-85	4556	195802	28800	-24244	. 0
02-Sep-85	4556	200358	28800	-24244	0
03-Sep-85	4556	204914	28800	-24244	0
04-Sep-85	3957	208871	28800	-24843	0
05-Sep-85	3957	212828	28800	-24843	0
06-Sep-85	3957	216785	28800	-24843	0
07-Sep-85	3957	220742	28800	-24843	0
08-Sep-85	3464	224206	28800	-25336	0
09-Sep-85	3464	227671	28800	-25336	0
10-Sep-85	3464	231135	28800	-25336	0
11-Sep-85	4897	236032	28800	-23903	0
12-Sep-85	4897	240928	28800	-23903	0



TABLE 2-2. STORAGE REQUIREMENT COMPUTATIONS (continued)

		Cumulative			Volume in
	Inflow	Inflow	Outflow	Excess	Storage
Date	(gpd)	(gal)	(gpd)	(gal)	(ga1)
25-0ct-85	3814	533582	28800	-24986	0
26-Oct-85	3814	537396	28800	-24986	0 .
27-Oct-85	3814	541209	28800	-24986	0
28-0ct-85	3814	545023	28800	-24986	0
29-Oct-85	4721	549744	28800	-24079	0
30-Oct-85	17104	566848	28800	-11696	0
31-0ct-85	17104	583952	28800	-11696	0
01-Nov-85	6077	590029	28800	-22723	0
02-Nov-85	6077	596107	28800	-22723	. 0
03-Nov-85	6077	602184	28800	-22723	0
04-Nov-85	6077	608261	28800	-22723	0
05-Nov-85	6077	614338	28800	-22723	0
06-Nov-85	6077	620416	28800	-22723	0
07-Nov-85	6077	626493	28800	-22723	0
08-Nov-85	5162	631655	28800	-23638	0
09-Nov-85	4148	635803	28800	-24652	0
10-Nov-85	4148	639950	28800	-24652	0
11-Nov-85	4148	644098	28800	-24652	0
12-Nov-85	5023	649121	28800	-23777	Ō
13-Nov-85	5193	654314	28800	-23607	0
14-Nov-85	4673	658987	28800	-24127	0
15-Nov-85	4805	663792	28800	-23995	0
16-Nov-85	4834	668626	28800	-23966	0
17-Nov-85	4834	673459	28800	-23966	0
18-Nov-85	4834	678293	2880D	-23966	0
19-Nov-85	4968	683261	28800	-23832	0
20-Nov-85	15227	698488	28800	-13573	0
21-Nov-85	9801	708289	28800	-18999	0
22-Nov-85	7445	715734	28800	-21355	0
23-Nov-85	7445	723179	28800	-21355	0
24-Nov-85	7445	730625	28800	-21355	, 0
25-Nov-85	7445	738070	28800	-21355	Ò
26-Nov-85	10376	748446	28800	-18424	Ö
27-Nov-85	14400	762846	28800	-14400	0 .
28-Nov-85	15643	778489	28800	-13157	Ō
29-Nov-85	15643	794132	28800	-13157	0 -
30-Nov-85	15643	809775	28800	-13157	Ö
01-Dec-85	4232	814007	28800	-24568	0
01-Dec-85	4232	818239	28800	-24568	0
02-Dec-85	4232	822471	28800	-24568	0
04-Dec-85	4232	826703	28800	-24568	0
05-Dec-85	4232	830935	28800	-24568	0
05-Dec-85	4232	835167	28800	-24568	Ö
CO DEC-OD	7000	333107	20000	27JUU	•



TABLE 2-2. STORAGE REQUIREMENT COMPUTATIONS (continued)

		Cumulative			Volume in
Dana	Inflow	Inflow	Outflow	Excess	Storage
Date	(gpd)	(gal)	(gpd)	(gal)	(gal)
07-Dec-85	4985	840152	28800	-23815	0
08-Dec-85	4985	845138	28800	-23815	0
09-Dec-85	4985	850123	28800	-23815	0
10-Dec-85	4850	854973	28800	-23950	0
11-Dec-85	5641	860614	28800	-23159	0
12-Dec-85	16113	876727	28800	-12687	0 0
13-Dec-85	4386	881113	28800	-24414	0
14-Dec-85	5166	886279	28800	-23634	0
15-Dec-85	5166	891444	28800	-23634	0
16-Dec-85	516 6	896610	28800	-23634	0
17-Dec-85	5133	901743	28800	-23667	0
18-Dec-85	5406	907149	28800	-23394	0
19-Dec-85	4168	911317	28800	-24632	0
20-Dec-85	5308	916625	28800	-23492	.0
21-Dec-85	5542	922167	28800	-23258	0
22-Dec-85	5542	927708	28800	-23258	. 0
23-Dec-85	5542	933250	28800	-23258	0
24-Dec-85	5083	938333	28800	-23717	0
25-Dec-85	5015	943347	28800	-23786	0
26-Dec-85	5015	948362	28800	-23786	0
27-Dec-85	5202	953564	28800	-23598	0
28-Dec-85	4331	957895	28800	-24469	0
29-Dec-85	4331	962225	28800	-24469	0
30-Dec-85	4331	966556	28800	-24469	0
31-Dec-85	10283	976839	28800	-18517	0
01-Jan-86	4480 4480	981319	28800	-24320	0
02-Jan-86	4480	985799 990279	28800 28800	-24320	0
03-Jan-86 04-Jan-86	4480	990279	28800	-24320 -24320	0
05-Jan-86	4480	999239	28800	-24320 -24320	0 0
05-5an-66	4480	1003719	28800	-24320	0
07-Jan-86	4480	1003/19	28800	-24320	0
08-Jan-86	4480	1012679	28800	-24320	0
09-Jan-86	5586	1018265	28800	-23214	Ö
10-Jan-86	4879	1023144	28800	-23921	Ö
11-Jan-86	4879	1028023	28800	-23921	Ö
12-Jan-86	4879	1032902	28800	-23921 -23921	Ö
13-Jan-86	4879	1037781	28800	-23921	Ö
14-Jan-86	5008	1042789	28800	-23792	0.
15-Jan-86	5241	1048030	28800	-23559	Ö
16-Jan-86	5004	1053034	28800	-23796	Ö
17-Jan-86	3008	1056042	28800	-25792	Ō
					=



TABLE 2-2. STORAGE REQUIREMENT COMPUTATIONS (continued)

	T = 51	Cumulative	•	_	Volume in
_	Inflow	Inflow	Outflow	Excess	Storage
Date	(gpd)	(gal)	(gpd)	(gal)	(gal)
18-Jan-86	628	1056670	28800	-28172	0
19-Jan-86	628	1057297	28800	-28172	0
20-Jan-86	628	1057925	28800	-28172	0
21-Jan-86	4869	1062794	28800	-23931	0
22-Jan-86	5111	1067905	28800	-23689	0
23-Jan-86	5205	1073110	28800	-23595	0
24-Jan-86	4939	1078049	28800	-23861	0
25-Jan-86	4985	1083034	28800	-23815	0
26-Jan-86	4985	1088020	28800	-23815	0
27-Jan-86	4985	1093005	28800	-23815	0
28-Jan-86	5380	1098385	28800	-23420	0
29-Jan-86	5040	1103425	28800	-23760	0
30-Jan-86	4934	1108359	28800	-23866	0
31-Jan-86	9768	1118127	28800	-19032	0



corresponds to a treatment rate of 20 gallons per minute. The fourth column is a running total of the ground-water inflow. The fifth column is the difference between in inflow and outflow. The rightmost column is the volume in tank storage and is a running total of the difference between inflow and outflow. Note that storage cannot be less than zero. As can be seen from this table, during normal periods, the 20 gpm treatment system would have been more than adequate to handle the inflows without the need for storage in the 22,000 gallon "FRAC" tank, if the water was treated on a continuous basis.

However it can also be seen that the maximum storage which would have been required with a treatment rate of 20 gallons per minute is 27,157 gallons. This occurred only once during the past months of operation and if the proposed system was used would have required trucking of the contents of the "FRAC" tank on this one day. It is recommended that LPC maintain arrangement with contract haulers to truck the excess water when it is necessary.

Also it is important to emphasize that these storage/inflow calculations do not assume any in-ground storage capacity in the collection systems and sump surrounding the building. These systems have a storage capacity of approximately 8500 gallons; so that during periods when inflows are assumed to "exceed" the capacity of the "FRAC" tank, the actual ground-water collection system has redundant excess storage capacity to allow sufficient time for contract hauling to be brought on-line to handle these increased inflows.



3.0 OVERVIEW OF PROPOSED TREATMENT SYSTEM

An activated carbon treatment system is recommended for pumped groundwater from the 100 Congress Avenue site.

3.1 Activated Carbon Treatment Technology

Activated carbon has been used for many years to remove organics from aqueous streams. There are numerous industrial process applications where it is employed in product purification. It is also widely used as a final treatment process for wastewater cleanup.

Activated carbon is produced by processing coal or other carbon sources in special kilns. Under the proper conditions, large internal surface areas are produced, as high as 1100-1200 square meters per gram. This large surface area is comprised of numerous micropores. On the pore surfaces are many electrically active sites. As organic molecules in water pass through these narrow pores, VanderWaal forces attract and bind the pollutants. Lesser attracted molecules, such as water, continue their migration through the bed.

The nature of the organic molecule has a large impact on the treatment effectiveness of activated carbon. In general, larger (higher molecular weight), low solubility compounds are removed to the highest degree and at the highest loading. Compounds not generally removed by carbon include small alcohols, acetone, methylene chloride, TCE, etc. Higher molecular weight compounds such as phenol and polynuclear aromatic hydrocarbon compounds are controlled very effectively with carbon. Since these compounds were identified in the water at the 100 Congress Avenue site in very low concentrations, the use of activated carbon is the treatment of choice.



3.2 Proposed Treatment System

The proposed treatment system includes gravity settling and equalization in a 22,000-gallon ("FRAC") tank followed by activated carbon filtration on a batch basis if required, depending upon the concentration of contaminants in the tank. Five days of effluent can be treated by the proposed system in one day at normal flows, and the system can handle the maximum daily flow rate experienced in the last four months. Figure 3-1 is a schematic diagram of the proposed system. The activated carbon absorber units are described in an attached technical bulletin together with recommended operating and maintenance procedures.

The proposed treatment system is designed to take advantage of the settling of coal tar particles by maintaining the tank as a settling vessel prior to filtration through the carbon beds. Monitoring of effluent discharges for an indicator parameter, total organic carbon (TOC), will be used to measure system performance quickly and effectively. If the TOC concentration in the effluents from this system is consistently above a specified level, the effluent will be analyzed for the presence of coal tar constituents (total extractable organics) to verify that these constituents are not passing through the carbon beds.

In addition to the treated wastewater, there will be four solid streams from the recommended treatment system — spent carbon from the activated carbon units, sludge from the FRAC tanks, sludge from the sump pump pit, and sand from sand traps in the excavation. These materials will be tested and disposed of in an appropriate manner in accordance with applicable regulations.

Additional measures, such as secondary containment after treatment (including Imbiber Beads®) are also currently under evaluation.

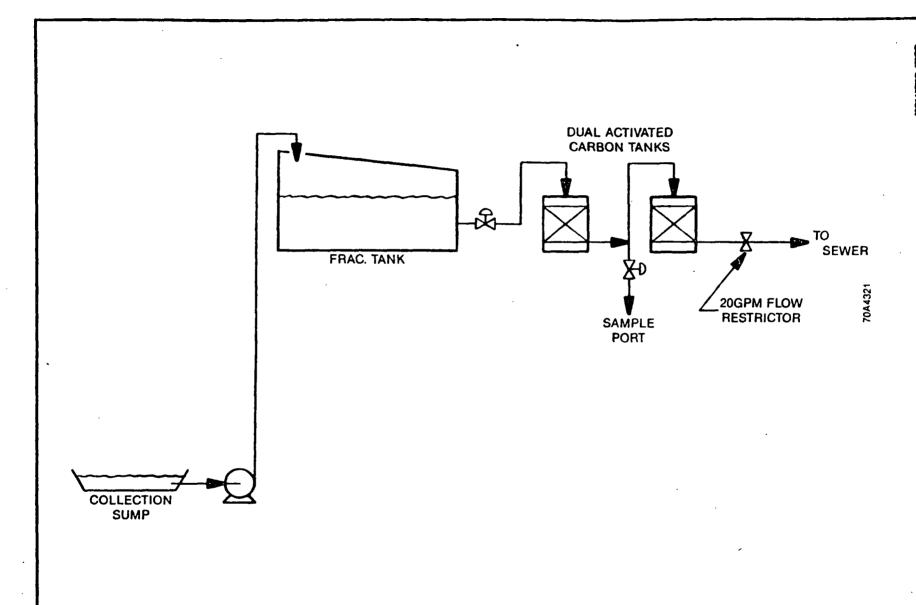


Figure 3-1. Schematic of Proposed Treatment System.



4.0 LABORATORY TREATABILITY TESTS

A laboratory activated carbon isotherm and a column test were performed on a groundwater sample from the 100 Congress Avenue site. Analysis of this groundwater indicated the presence of base/neutral organics as the pollutants of concern. Volatile and acid fraction organics were either not detected or present at extremely low levels.

Table 4-1 shows a comparison of the quality of water before and after passing through a bench-scale carbon column. Also shown are the water quality data from the initial sampling event. As can be seen in the table, the carbon treatment removes virtually all of the coal tar contaminants. The detailed analytical data are contained in Appendix B.

An isotherm was conducted in the laboratory at seven dose levels using Filtrasorb 300 from Calgon. The results of this isotherm in terms of residual total organic carbon (TOC) values are shown in Figure 4-1. The maximum carbon loading for an effluent TOC of 1 mg/L based on this isotherm is approximately 2.5 mg/g. It is important to note that the base/neutral organics identified in the water (anthracene, phenanthrene, napthalene, etc.) are readily sorbable, having adsorption capacities at 1 mg/L equilibrium concentrations of 100-300 mg/g of carbon. A base/neutral analysis of the wastewater after one of the lower carbon dose rates revealed low levels (<10 ug/L) of polynuclear aromatics. Consequently, the organic material which is not readily sorbable is most likely biological in nature (carboxylic acids, alcohols, humic acids, other compounds) that do not originate from the coal tar). These compounds are generally amenable to biological degradation and are most likely the result of normal urban/construction site runoff.

In order to confirm the isotherm information, a column test was run using carbon and the wastewater. The results of this test are presented in Figure 4-2. This figure shows the influent and effluent TOC as a function of the volume of water treated. A sample taken after about 80 bed volumes was

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TABLE 4-1. COMPARISON OF WATER QUALITY OF CONTAMINATED GROUND WATER BEFORE AND AFTER ACTIVATED CARBON TREATMENT IN THE LABORATORY

Parameters	From Pit, 7/85 (mg/L)	From FRAC Tank, 10/85 (mg/L)	From Carbon Bed Effluent, 10/85 (mg/L)
Total Volatile Organic Compounds (EPA Method 624)	11.2	0.01	ND ¹
Total Base/Neutral Organic Compounds (EPA Method 625)	56.2	0.05	ND
Total Organic Carbon	NA	20	5
COD	NA	110	7
BOD	NA	4	1
рН	7.3	8.2	8.2

 $^{{}^{1}}_{2}ND = not detected$ NA = not analyzed

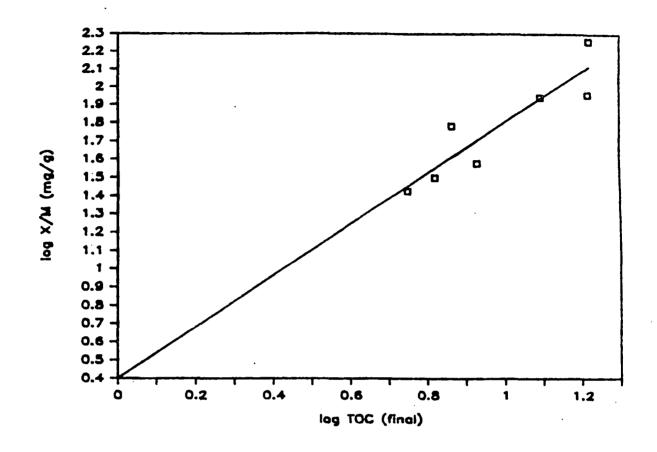


Figure 4-1 Isotherm in terms of residual TOC, 100 Congress Avenue Construction Site

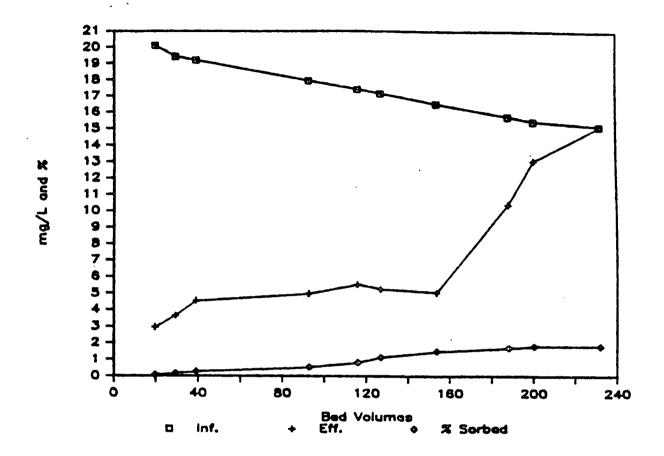


Figure 4-2 GAC Column Test Results, 100 Congress Avenue Construction Site



analyzed for base neutral organics. The only compound identified in this category was a substituted pthalate, possibly contributed by plasticizers in the sample bottle. This indicates that the carbon is doing a very effective job in controlling the toxic organics even though the TOC removal is not high. Consequently, it is difficult to specify the appropriate test to monitor the performance of the activated carbon.

TOC is an easily measured value. However, in this case (as in many other wastewaters), it includes both toxic and non-toxic organic compounds. There are indications that normal construction site runoff is contributing a TOC load which is more amenable to biological degradation than carbon adsorption. Gas chromatography/mass spectroscopy (GC/MS) is used to identify all of the toxic compounds present in the water. Although this is a semi-quantitive measurement, there is a large discrepancy between the sum of toxic organics determined by GC/MS and the TOC value. Consequently, the carbon could be removing all the toxics with only a slight decrease observed in TOC influent and effluent values. This indicates that GC/MS might best be used as the monitoring parameter; however, it is a time-consuming and costly analytical method for routine discharge monitoring.

A more cost-effective and timely measurement would be a total extractable organic (TEO) analysis. In this procedure, the sample is prepared in the same manner as for the base/neutral GC/MS test -- extraction with methylene chloride. This extraction does not remove biological organic compounds. Instead of using the GC/MS, a gas chromatograph is employed. The total area of the chromatogram is obtained and reported as TEO concentration without speciation.



5.0 FIELD TREATMENT DEMONSTRATION

In addition to the laboratory treatability tests, Radian performed a treatment demonstration of contaminated water pumped from the 100 Congress Avenue site. Treatment was accomplished through the use of a dual carbon bed filtration unit. Water samples were taken throughout the field study and analyzed to determine the level of treatment attained.

5.1 Pilot Scale Filtration System

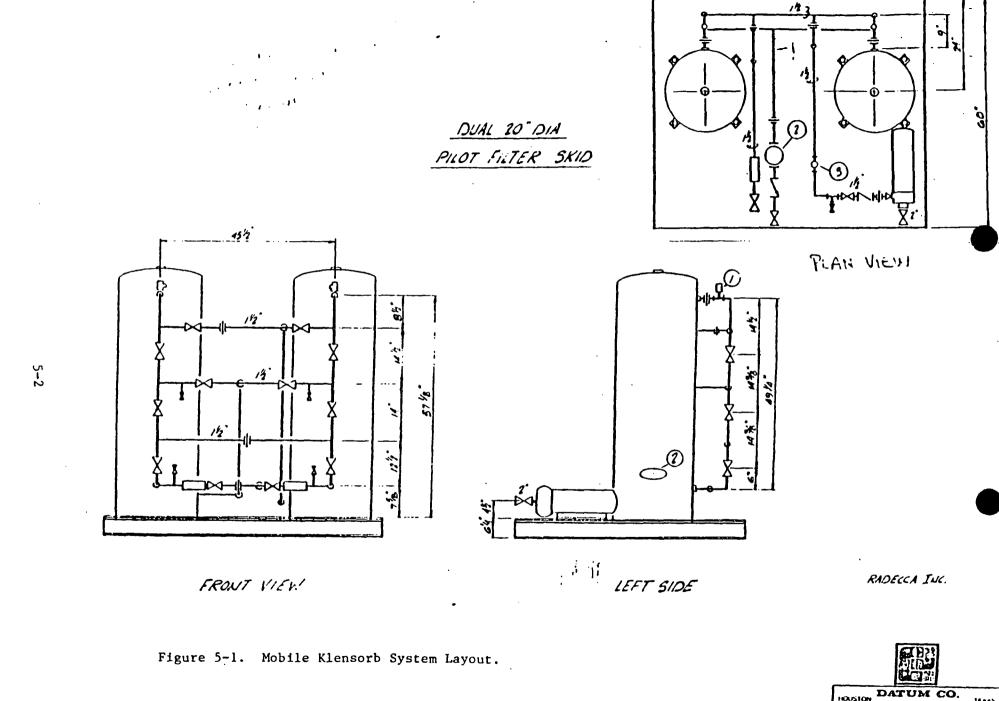
5.1.1 General Description

'n

The skid-mounted carbon filtration pilot unit is used for removing organics from waste water. A sketch of the pilot unit is shown in Figure 5-1. The equipment on the skid consists of the following:

- o A pump with motor control;
- o Two tanks:
- o Flow control valves;
- o Piping capable of operating the tanks in series, parallel, or in a backflush mode; and
- o Sampling ports.

Each tank (carbon column) has a diameter of 20 inches and the flow rate through the tanks in series is 20 gpm. The Installation and Operation Manual (Appendix A) contains a more detailed description of the system to the reader.



PILOT FILTER SKID

ASTRONOM DATUM CO.

1644

PILOT FILTER SKID

9719

1718



5.1.2 Field Preparation

The activities described below were required to prepare the unit for field.

System Flush

The entire unit - tanks, piping, values - were flushed with water to remove accumulated debris and to insure that valves were working.

Tank Loading

Both carbon columns were filled with pea gravel and activated carbon. One bag of pea gravel was placed in the bottom of each tank to cover the underdrain. Three bags of activated carbon were then placed in each tank.

Replace Manhole Gaskets

The manhole at the top of each tank has a gasket which required replacement. New gaskets were cut from a sheet of neoprene rubber.

Pressure Test

After tightening the manholes down, the entire system was filled with water to check for gasket leaks.

Backflush System

The system was backflushed to remove fines from the activated carbon. Water was run through the columns until the effluent was clear.



5.2 Sampling and Analysis

The objective of the sampling and analysis program was to establish the level of treatment attained by adsorption. The approach for achieving this objective was sample collection and analysis followed by comparison of water quality data for the water before and after treatment.

Samples were obtained from sampling ports located at various points of the pilot unit. All sample were labelled using the letters I for influent, E for effluent, and B for field blank. Samples were logged in on standard chain-of-custody forms. All samples were preserved in the field.

Table 5-1 lists the analytical parameters, containers used for sample collection, preservatives used, and labelling codes.

5.3 Treatment Demonstration

The pilot unit was taken to the site on 21 February 1986. A submersible pump was lowered to the bottom of the FRAC Tank (wastewaterstorage reservoir). The pump discharge hose was routed to the intake of the pilot unit. The discharge line from the pilot unit was fed back to the top of the tank. This arrangement provided circulation of the wastewater through the tank for equal treatment. This also precluded the need for using the pump system on the pilot unit. Valves were positioned to operate the carbon columns in series, allowing the greatest sorbent-wastewater contact.

Treatment was performed over a continuous 26-hour period on 24 and 25 February 1986. During this time, two influent samples were taken to determine any variability in wastewater quality and three effluent samples were taken to determine the level of treatment attained. A complete set of field blanks was also provided for laboratory analysis.

RADIAN

TABLE 5-1. ANALYSIS OF WATER SAMPLES

Parameter	Container	Preservative	Label Code
pH, Chlorides, TDS, TSS, BOD, Sulfates	1-L plastic	4°C	pН
Settleable Matter	1-L plastic	4°C	s
COD, Phosphates, Phenols	500-ml glass	H ₂ SO ₄ (pH <2).	COD
Cyanide	250-ml plastic	NaOH (pH >10). 4°C	CA
Formaldehyde	500-m1 glass	4°C	F
Metals	500-ml plastic	HNO ₃ (pH <2),	М
Acids and Base/ Neutrals (EPA 625)	1-L glass	4°C	ABN
Volatiles (EPA 624)	40-ml glass (2)	4°C	VOA



Table 5-2 lists the time samples were taken and the labeling scheme used.

Attachment A provides recommended operation and maintenance procedures used during treatment operations at 100 Congress Avenue site.

5.4 Results

Laboratory analytical data are appended to this report. Table 5-3 summarizes these results. The data generated during the treatment demonstration indicate that the levels of coal tar contaminants in the water obtained from the "FRAC" tank during the treatment demonstration were at or below analytical detection limits.

RADIAN

TABLE 5-2. COLLECTION OF WATER SAMPLES FROM FIELD DEMONSTRATION UNIT

Date	Time	Sample Obtained	Label*
24 February	9:50 AM	Influent	I-1 - Code
24 February	10:15 AM	Effluent	E-1 - Code
24 February	2:00 PM	Effluent	E-2 - Code
24 February		Field Blank	B-1 - Code
25 February	9:55 AM	Influent	I-2 - Code
25 February	10:20 AM	Effluent	E-3 - Code

^{*&#}x27;Code' refers to the appropriate label code listed in Table 5-1 for each sample container.

TABLE 5-3. SUMMARY OF ANALYTICAL RESULTS FROM FIELD TREATMENT DEMONSTRATION AT 100 CONGRESS AVENUE SITE

Parameters	Influent (I-1)	Influent (I-2)	Effluent (E-1)	Effluent (E-2)	Effluent (E-3)
Total Volatile Organics (mg/L)	ND ¹	NA ²	ND	ND	NA
Total Base Neutral 3 (mg/L)	ND	ND	ND	ND	ND
Total Acid Fraction ⁴ (mg/L)	ND	ND	ND	ND	ND
COD (mg/L)	< 5	21	< 5	15	13
BOD (mg/L)	12	9	3	4	7
pH (pH units)	8.8	8.22	8.83	8.71	8.58

 $^{^{1}}_{2}$ ND = Not Detected. $^{2}_{2}$ NA = Not Analyzed. $^{3}_{3}$ Some detectable phthalate compounds found which are interpreted to be lab or field contemination.

Very low levels (1-3 µg/L) at phenols found in some effluent samples.



6.0 RECOMMENDED TREATMENT AND MONITORING PROGRAM

Based upon laboratory and field tests, Radian recommends that a skid-mounted activated carbon unit be used for treatment of groundwater pumped from the 100 Congress Avenue site. This treatment system is recommended as the most cost-effective and environmentally sound procedure available. The use of activated carbon to control toxic organics is well documented and considered to be a tertiary treatment, a step above the wastewater treatment practices of the City of Austin. The small flow (<10 gpm) of detoxified water would have a negligible impact on the wastewater treatment system or the receiving body of water.

The following specific procedures are recommended.

Treatment and Discharge. The water should continue to be collected in a 22,000 gallon FRAC tank. The solids should be allowed to settle, and the water should then be treated by activated carbon in a skid-mounted unit as described above. The treatment will be for hazardous organic constituents in two columns operated in series. Discharge may then be either to the City of Austin wastewater treatment system (preferable) or to the storm sewer.

Monitoring. Weekly sampling should be conducted from the first and second carbon column effluents. Analysis should be routinely for total organic carbon. If the concentration of TOC exceeds 20 mg/L, monitoring for total excractable organics should be initiated. When the TEO concentration exceeds 0.5 mg/L, the activated carbon should be replaced. Monitoring for both TOC and TEO should continue as long as the concentration of TOC remains above 20 mg/L and TEO remains below 0.5 mg/L. If TOC levels fall below 20 mg/L, TEO monitoring may be discontinued.

Although the monitoring limits are somewhat unusual, Radian feels they are justified because of the uniqueness of the situation. The wastewater



composition is highly variable, dependent upon such conditions as recent rainfall and construction site operations. As demonstrated by the isotherm and column tests, TOC effluent levels of 5-15 ppm do not contain any toxic organics after contact with carbon. Consequently, as long as the TOC is being removed across the carbon, it is most probable that no toxics are being discharged. If, due to unforeseen circumstances, the TOC should exceed 20 mg/L in the effluent, LPC has the option of either replacing the carbon or performing the total extractable organic analysis to determine if breakthrough has occurred. If the TEO result is above 0.5 mg/L, the carbon will be replaced.

In addition to the treated wastewater, there will be four solid streams from the recommended treatment system — spent carbon from the activated carbon units, sludge from the FRAC tanks, sludge from the sump pump pit, and sand from sand traps in the excavation. These materials will be tested and disposed of in an appropriate manner in accordance with applicable regulations.



APPENDIX A

Operation and Maintenance Procedures for the
Pilot Filtration System
and
Installation and Operation of Mobile
KLENSORB Systems Manual



OPERATION AND MAINTENANCE PROCEDURES FOR THE PILOT FILTRATION SYSTEM

The pilot filtration unit is a fairly simple unit process. Once installed and operational, it will require minimal observation. The system is capable of automatic operation which should be utilized. Operation of the unit is envisioned as follows.

A surge/separation tank will be required to store raw water. A level switch in this tank will be used to operated the pump on the pilot unit. It is recommended that the switch shut off the pump when 2-3 feet of water remain in the tank. This will provide adequate surge volume for additional water and a net positive suction head for the pump. The valves will remain in a standard configuration without adjustment.

Daily readings should include pressure drop across the two tanks, pump pressure, and volume of water treated. Table 1 is a suggested operating data sheet. When the pressure drop across the beds double, each tank should be backwashed for 10-15 minutes. The procedures for backwashing and the proper valve configurations are presented in the attached Installation Manual. The pump bearings should be greased on a semi-monthly basis. Replacement of the activated carbon will be required periodically based on the analytical results. The procedure for evacuating and loading the columns is presented in the manual also. Any other operating or maintenance problems should be referred to Radian personnel. Spare fuses are located in the control panel in the event of a power failure. Mechanically, plugging of the lines is the only potential problem envisioned.

TABLE 1 Pilot Filtration System Operating Log

		Pressu	re Drop	Pump		
Date	Time	Tank 1	Tank 2	Pressure	Volume Volume	Comments

INSTALLATION AND OPERATION OF MOBILE KLENSORB SYSTEMS

ВУ

GREG P. BEHRENS

RADECCA INC.

P.O. BOX 9948

AUSTIN, TEXAS

78766

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INTRODUCTION

This document serves as a reference for the installation and operation of Radecca's Mobile Klensorb Systems (MKS), skid mounted pilot systems for removing organics from wastewater. The equipment on the skids consists of a pump with a motor control wired to accept either 240 or 480V three phase service, two tanks, flow control valves, a totalizer, differential pressure gauges, and piping capable of operating the tanks in series, parallel, or in a backflush mode. Table 1 identifies the various MKS systems owned by Radecca and their sizes and peculiarities. Figures 1, 2, and 3 are diagrams of the MKS. Figure 3 shows the locations of the valves on the MKS. These valves are identified by number in Table 2.

TABLE 1
Radecca Mobile Klensorb Systems

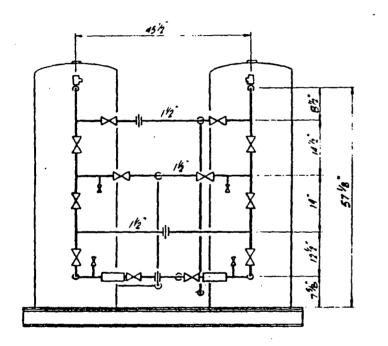
<u>Unit</u>	Tank Diameter (in.)	Series Flow Rate (gpm)	<u>Other</u>
01 MKS	20	10	
02 MKS	30	20	
03 MKS	30	20	Trailer
04 MKS	30	20	Trailer, Explosion proof

INSTALLATION

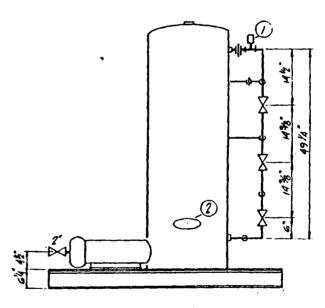
The MKS are either trailer or skid mounted. The skid unit, 8' X 6'6", is approximately 7'6" high. Empty weight is about 3500 pounds (the Ol-MKS is 5' X 6' X 6' high, 2500 pounds). Fork lift slots (54" center to center) are located on both 8' sides. Lifting lugs are also located on all four corners of the skid for placement with a crane. Spreader bars 10 feet in length should be used with a crane to avoid equipment damage.

DUAL 20" DIA PILOT FILTER SKID

() PSV (2) (2) CLEAN OUT (2)



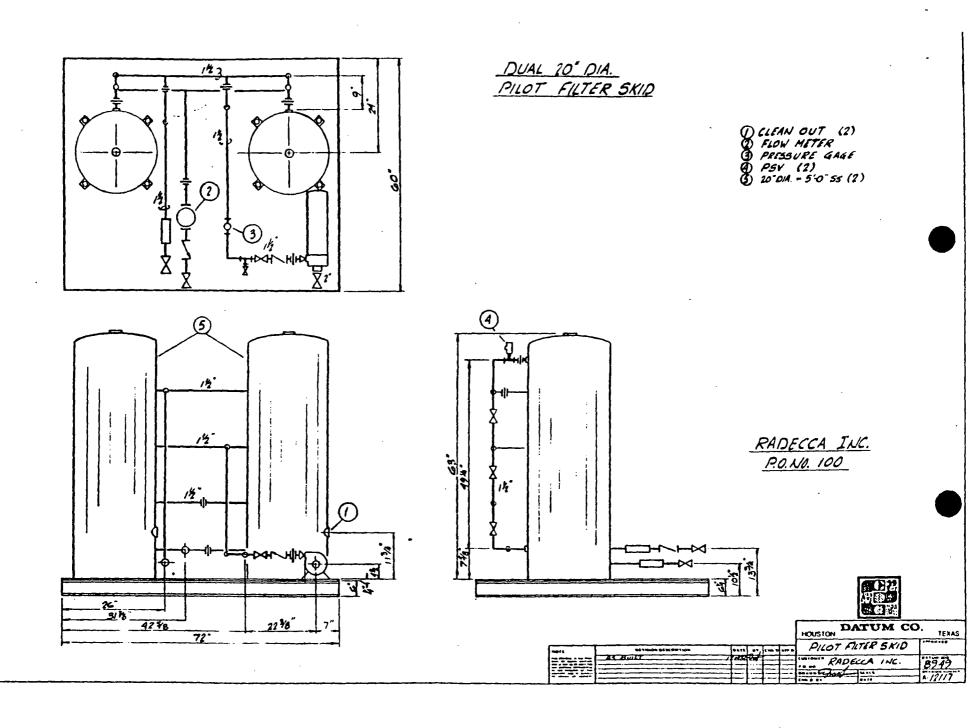
FRONT VIEW



LEFT SIDE

RADECCA INC.

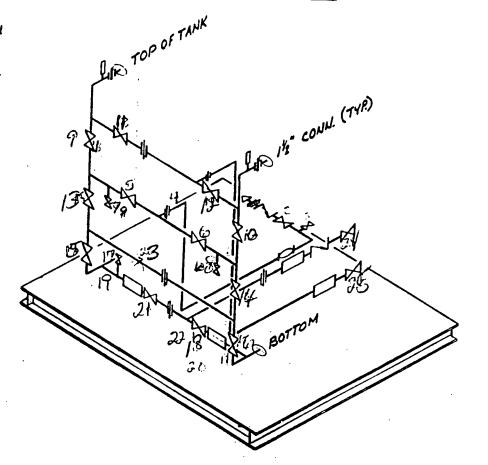
				C 28	
				HOUSTON DATUM CO	TEXAS
 Of reports access upon		e.	 	PILOT FILTER SKID	********
AS BULLY	7100	7		customes	8949
	Ш			Com 0 01/ 0411	12/18°



PWS 3 SAMPLING VALVES

DUAL 20° DIA. PILOT FILTER SKID

JEUNCUATION BEV JAL



NOTE! TANKS ARE NOT SHOWN

FOR DIMENSION SEE PLAN & ELEVATION DWGS.

RADECCA INC. P.O. NO. 100

> CH XB VS

HOUSION DATUM CO. TEXAS

TO BUILT PLOT FILTER SKID

TO STANDARD STREET SKID

TO STANDARD STREET

TABLE 2 - VALVE IDENTIFICATION

1	Pump Suction
2	Pump Discharge
3	Alternate Supply Line
4	Inlet Sample
5	Left Tank Feed
6	Right Tank Feed
7	Left High Side ΔP
8	Right High Side ΔP
9	Left Normal Feed
10	Right Normal Feed
11	Left Backflush
12	Right Backflush
13	Left Midvalve
14	Right Midvalve
15	Left Upflow
16	Right Upflow
17	Left Low Side ΔP
18	Right Low Side ΔP
19	Left Tank Sample
20	Right Tank Sample
21	Left Normal Effluent
22	Right Normal Effluent
23	Crossover
24	Effluent
25	Backflush
26	Left Tank Purge
27	Right Tank Purge

The trailer mounted unit is about 9' high with a tandem axle. Four stabilizers are located at each corner of the unit which are used to prevent tire damage during operation. Either type of unit is entirely weatherproof, allowing indoor or outdoor installation. The units have no freeze protection.

Piping

The skid mounted pump will be used in most applications. An alternate feed connection (V3) is available if the wastewater is available under pressure (20 psi or greater). The pump suction has a 1-1/2" threaded (female) ball valve (V1) for connection to the wastewater supply. (O1-MKS has a 2" ball valve.) It is recommended that a foot valve be installed in the supply line to prevent loss of pump prime. The pump has an operating suction head of 20 feet. Further information about the pump is given at the back of this document. If a pressurized supply line is available, flow enters the system downstream of the pump at V3, a 1-1/2" threaded (female) ball valve. Effluent from the MKS flows from V24, a 1-1/2" threaded (female) ball valve. The backflush line, V25, is also a 1-1/2" threaded ball valve. The tank purge valves 26 and 27 are 1-1/2" on O1 and O2-MKS, 2" ball valves on O3 and O4-MKS.

Electrical

If the skid mounted pump is used, electrical power is required to run the motor. The motor supplied is a 3 horsepower, totally enclosed fan cooled (TEFC) model. The 04-MKS also has an explosion proof control box. The control panel has been designed to accept either a 240 (30 amp) or 480V (15 amp) three phase power supply. A blueprint is located in the jacket on the inside of the weatherproof control door panel. The various parts in the panel are identified in the back of this document. A lug is

The supply line must be sized per the National Electric Code to match the owner supplied feeder breaker. If the power supply is floating (delta), then a ground rod should be installed per the National Electric Code and connected to the ground lug in the panel. The incoming service should be routed through the conduit opening at the bottom of the control panel and connected to the line side of the circuit breaker (CB1).

In order to start the pump for the first time, first place the 480/240 V selector switch (SW1) in the correct service voltage position. Verify that the hand-off-auto switch (SW2) on the control panel door is in the off position, also verify that the circuit breaker is off. Turn on the service voltage and verify that all three phases are available on the CB1 input terminals. Next turn on CB1. Turn the H-O-A switch to the hand position. The motor should run. There are two probable causes if the motor does not run. First check the appropriate over/under voltage relay. If one of the LED's is lit, adjustment of the related trip set point is required. Turn off SW2 and CB1, adjust the set point, and reapply power. NOTE: The LED is difficult to see in bright light. If the motor still does not run, reverse any two of the incoming leads, after deenergizing the feeder breaker. This should cause the motor to run. The motor will not turn in the wrong direction if the leads are improperly connected.

If the motor still does not run, test all the fuses to verify that voltage is available on each side of the terminal. A qualified electrician should perform this operation to prevent personnel or equipment damage. In certain applications, it may be desirable to operate this system on automatic level control. The control panel has the capability of automatic operation. This option should be discussed with a Radecca engineer prior to operation of the unit.

Sorbent Loading

The columns are equipped with an underdrain manifold system and a backflush header. Pea gravel should be loaded into the column to a level 3-4" above the underdrain. This is approximately at the bottom lip of the manhole. Sorbent material can then be loaded in the top manhole to a depth of 2-3 feet (6-9 drums per column). The manholes should then be replaced and checked for gasket leaks by filling the columns with water before commencing operation.

OPERATION

Operation of the MKS is fairly straight forward and is discussed below, however, two associated actions, backflushing and disposal of spent sorbent, require some instructions.

Backflushing

Prior to using the MKS, it is necessary to backflush the sorbent to remove anthracite fines which can cause excessive bed pressure drop. The anthracite is currently used in the sorbent formulation as a diluent to improve the flow characteristics of the sorbent bed. Backflushing is accomplished by flowing clean or process water up through the columns. Table 3 lists the valve settings for various backflush operations. The water exits the skid at V25. Backflushing should be maintained until the effluent is free of fines. The columns can be backflushed singly, in parallel, or while one column is in operation. The flow rate is held to about 10 gpm per column by a flow control valve. The pump pressure gauge should read 55-60 psig at the proper flow rate. The O1 and O2 MKS systems have only single flow control valves which are set at 5 and 10 gpm respectively.

TABLE 3
Backflush Valve Settings

<u>Valve</u>	Backflush Left Tank	Backflush Right Tank	Backflush Both Tanks	Backflush* Left, Flow Right	Backflush* Right, Flow Left
1	X	X	Χ	X	X
2	X	Х	Χ	Χ	χ
3					•
4					
5	X		X .	- Х	X
6		X	X	X	X
7	•				X
8	·			X	
9					X
10	•			X	
11	X		X	X	
12		X	X		X
10	V				
13	X		X	X	
14		X	X		X
15	X		X	X	
16		X	X		X
17		•			X
18				X	
19					
20					
21					X
22				X	
23				,	
24				X	Х
25	X	X	X	X	X
26					
27				•	

Unless checked, valve is closed.

 $[\]star$ Cannot be done with O1-MKS, V23 not present.

In Service

The columns can be operated singly, in series, or in a parallel mode. Flow control valves limit the capacity of each column to 20 gpm, regardless of single or series operation (10 gpm for 01 MKS). Parallel operation produces a flow of 40 gpm. Table 4 details the valve position for the various configurations.

Normally, series flow is used. This allows for the greatest sorbent-wastewater contact. Additionally, samples of the effluent from the first column can be analyzed to determine breakthrough before the effluent quality deteriorates. When the first column is exhausted, the sorbent can be changed and the contactors reversed in order to consume the sorbent in the second tank while polishing with the new material.

Each column is also equipped with a differential pressure gauge. Fresh beds typically have pressure drops of less than 5 psi after adequate backwashing. The MKS is equipped with a flow totalizer which records the volume of wastewater treated. With experience, the user should be able to predict sorbent exhaustion based on the volume of water treated. Pressure relief valves on each column are set at 100 psi. Each contactor is rated at a maximum pressure of 125 psi.

Sorbent Removal

Changing the sorbent will be necessary on a periodic basis, which can be estimated using the flow rate and inlet organic concentration. Figure 4 can be used as an approximation of the sorbent life for oily wastewaters. For example, a 100 ppm oil stream should be effectively treated for 16 days if 9 drums of sorbent are used.

TABLE 4
Valve Settings For Inservice Flow

VALVE	FLOW THROUGH LEFT TANK	FLOW THROUGH RIGHT TANK	PARALLEL FLOW	SERIES RIGHT TO LEFT	SERIES LEFT TO RIGHT
1	X	X	Х	X	X
2	X	X	X	X	X
3					
4					
5	X		X		X
6		X	Х	X	
7	X		Χ	X	X
8		X	X	X	X
9	X		Χ	X	X
10		X	X	X	X
11					
12					
13				Х	
14					X
15				•	X
16				X	
17	X		X	X	X
18		X	X	X	X
19					
20					
21	X		χ	Χ .	
22		X	Χ		Χ
23				X	χ
24	X	X _	Х	X	X
25		-			
26					
27				•	

^{*} Unless checked, valve is closed.

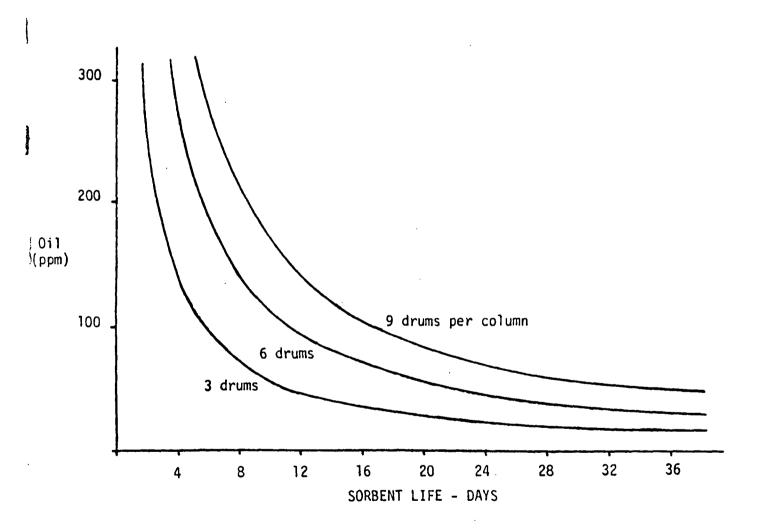
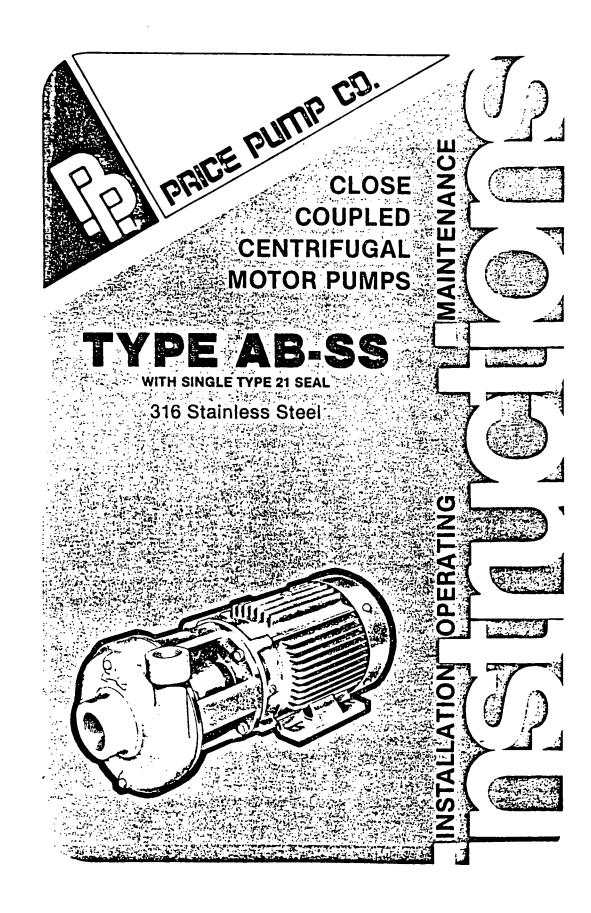


Figure 4 - Approximate Sorbent Life vs. Oil Concentration (20 gpm, single column calculation)

Valve Settings for Evacuating Columns

1	Valve	Empty Left	Empty Right
2 X X X 3 4 5 X 6 7 7 7 9 10 11 12 13 X X 14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X			
3 4 5 X 6 7 7 9 10 11 12 13 X 14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X			
4 5 X 6 7 7 9 10 11 12 13 X 14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X		•	^
6			
6	. 5	X	
7 7 9 10 11 12 13	6		X
9 10 11 12 13	7		
10 11 12 13	7		
11 12 13	9		
12 13 X 14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X	10	,	
12 13 X 14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X	11		
14 X 15 X 16 X 17 18 19 20 21 22 23 24 25 26 X	12	•	
15 X X 16 X 17 18 19 20 21 22 23 24 25 26 X	13	X	
16 X 17 18 19 20 21 22 23 24 25 26 X	14		X
17 18 19 20 21 22 23 24 25 26	15	X	
18 19 20 21 22 23 24 25 26	16		X
19 20 21 22 23 24 25 26	17		
20 21 22 23 24 25 26 X	18		
21 22 23 24 25 26 X	19		
22 23 24 25 26 X	20		
23 24 25 26 X	21		
24 25 26 X	22		
25 26 X	23		
26 X	24		
	25		
27 X	26	X	
	27		X

EQUIPMENT INFORMATION



RIFUGAL PUMP **GENERAL** INSTRUCTIONS Price Pump Co. produces several models

of straight centrifugal pumps and self-priming centrifugal pumps. They are made of several different materials as well. In general, the instructions are the same for all.

INSTALLATION

Base Mounted Pumps (Pedestal Pumps)

These pumps should be mounted on a rigid steel base that will not warp or flex. Each pump must be mounted in such a way that the pump shaft centerline is on center with the driver shaft centerline. Pads and/or shims will be required on either pump, driver or both. The two shafts should not butt and distance between them will depend on coupling used. Do use a flexible coupling and align it properly using straight edges and/or indicators. Misalignment will cause bearing failure and void warranty. Pulley driven pumps must have pulleys in line and good belt tightness practices followed.

Close Coupled - Motor Pumps

These pumps require no special care in mounting, although it is suggested that they be firmly bolted to whatever surface is used. Adequate air movement over motor will help prevent overloads.

Piping

All piping should be supported independently of the pump. Do not place a strain on the volute. All suction and discharge should be made as short and direct as possible to reduce the friction head.

- 1. Suction Piping always place the end of the a suction pipe at least three feet below the surface of the liquid to prevent air from being drawn into the pump, as air leaks will cause the pump to lose prime, Horizontal lines of suction pipe should slope downward from the pump to avoid air pockets. Provide a strainer if possible. Suction lines must be at least the same size as inlet, or the next size larger, if possible.
- 2. Discharge Piping It is advisable to install a valve (Gate, Globe or Ball) and a check valve in the discharge line and close to the pump. The valve can be used to control the pump flow (closing valve increases friction loss, thus increasing head and reducing flow). It also allows the line to be shut if repairs are being made. A check valve will prevent back flow when pump is shut down.
- 3. If pump is installed above the liquid, a check or foot valve must be installed in the suction line, if the pump is not a self-priming unit, at the

furthest possible point from the pump. Use a suction no smaller than the suction size of the pump. If the line has several els, etc., we suggest using the next larger size.

Suction Lift — static plus friction, must not exceed that recommended.
 Vapor pressure must be considered also. Contact factory for NPSH required.

OPERATING

Centrifugal pumps must receive an initial prime in ALL cases.

- 1. Priming Do not start pump before priming, except to check for proper rotation. Running in reverse may cause impeller to spin off. Merely jog switch to check rotation. Do not run pump with liquid in reverse, as this will increase possibility of impeller spinning off. Completely fill the pump volute and suction line. Remove air from volute by removing top pipe plug of volute while filling. After filling, check by turning pump shaft a few times. Add more water if required. It is suggested that during initial start-up that the discharge valve be closed and gradually opened as motor developes full r.p.m. This allows a gradual build up of power requirement. If pump does not build up pressure as motor develops speed, shut down and reprime. Do not attempt to prime pump or add liquid while pump is in operation.
- 2. Starting a new or repaired pump Follow instruction above after first checking for proper rotation. Also make sure impeller turns freely within the volute. Sometimes a new seal will leak slightly, but this should disappear within a few hours.

MAINTENANCE

- 1. Motor Pumps If sleeve-ball combination motors are supplied, the sleeve should be relubricated with the proper oil every six to twelve months as indicated on the motor.
- 2. Servicing & Repair For specific seal service instructions and parts drawings and repair parts lists please read the other side of this pamphlet.

TROUBLE SHOOTING:

- 1. No liquid delivered:
 - a. Pump not primed.
 - Speed too low. Check voltage and frequency of driver, pulley selection, etc.
 - c. Air leak in suction.
 - d. Discharge head too high for pump. Use larger lines and reduce els, etc. or a different pump model.
 - e. Suction lift too high. Consider vapor pressure and temperature. Increase size of suction pipe. Relocate pump.
 - f. Incorrect rotation. Must rotate in direction of arrow cast on volute.

2. Not enough liquid delivered:

- a. Air leaks in suction.
- b. Speed too low
- c. Discharge head too high or higher than calculated
- d. Inadequate suction head to hot liquid.
- e. Impeller or volute worn.
- f. Excessive clearance between volute and impeller of semi-open impeller pumps. Reset by loosening set screws of bearing adapter (Pedestal Pumps) or pump shaft (Motor Pumps) and move impeller toward volute. Recommend clearance is .010"
- g. Suction not submerged enough, causing air to enter suction line.

3. Not enough pressure:

- a. Speed too low.
- b. Air or gas in liquid or leaking suction line.
- c. Damaged Impeller.

4. Pump gradually loses suction:

- a. Leaky suction line
- b. Too high suction lift.
- c. Open end of suction line.
- d. Air or gas in liquid.

5. Motor runs hot. (Note: Most motors will feel hot even when not overloaded.)

- a. Discharge head too low or lower than calculated causing pump to deliver a higher volume. Throttle discharge with valve.
- b. Heavy liquid or viscous liquid.
- c. Seal binding.
- d. Low voltage or low frequency.

6. Seal leaks:

- a. Improper assembly
- b. Worn or cracked seal faces.
- c. Abrasive material being pumped building up around seal causing faces to separate.
- d. Running dry.
- e. Liquid not compatible with elastomers or other parts of seal.

WARRANTY AND CONDITIONS: Price Pump Mfg. Co. warrants pumps and parts and other devices of its manufacture and bearing its nameplate, when not misused or neglected, to be free from defects in workmanship or materials. The Company's obligation under this warranty is limited to repairing or replacing at its factory, any such product or part thereof which shall within one year after delivery to the original purchaser be returned to the factory, transportation charges prepaid and which on examination reveals to have been thus defective. The Company assumes no liability for consequential or contingent damages of any kind arising out of the failure of its product. A defect in the meaning of this warranty, in any part of said equipment shall not, when such part is capable of being repaired or replaced, operate to condemn such equipment. THIS WARRANTY IS EXPRESSLY IN LIEU OF OTHER WARRANTIES, OBLIGATIONS OR LIABILITIES EXPRESSED OR IMPLIED BY THE COMPANY OR ITS REPRESENTATIVES. ALL STATUTORY OR IMPLIED WARRANTIES, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OF FITNESS, OTHER THAN TITLE, ARE HEREBY EXPRESSLY NEGATED AND EXCLUDED.

DISASSEMBLY

- DISCONNECT POWER SOURCE TO MOTOR
- 2. DISCONNECT ELECTRICAL CONNECTIONS, tagging wires carefully to preserve correct rotation. Loosen pump base.
- 3. LOOSEN THE EIGHT 3/8"-16 BOLTS holding the volute to the motor bracket. Volute may be left in piping.
- 4. SLIDE PUMP AWAY FROM VOLUTE until impeller is exposed.
- 5. LOOSEN AND REMOVE THE THREE 1/4-20 SET SCREWS holding pump shaft to motor shaft.
- 6. REMOVE IMPELLER, SHAFT & SEAL as a unit. Pullers may be used or 2 large screwdrivers prying between back of impeller and bracket.
- 7. If seal seat did not come out with shaft, pry from cavity. We suggest motor bracket not be removed.
- 8. REMOVE SEAL FROM SHAFT by sliding toward motor end of shaft. May require force. Do not attempt to salvage.
- 9. INSPECT SHAFT FOR WEAR. Remove impeller and snap ring.
 Note: Shaft has internal keyway. Check and remove key if not already out.

REASSEMBLY

- 1. CLEAN BRACKET AND SEAL CAVITY CAREFULLY.
- 2. INSTALL NEW SEAT INTO CAVITY. Lubricate seat cup and tap gently into place. Make sure seat is flat. Do not scratch surface. Use hollow wood dowel or plastic pipe.
- 3. INSTALL SHAFT, aligning motor keyway and internal shaft keyway. Place key on motor shaft. Assembly eased by placing unit on bench with shaft up.
- 4. LUBRICATE SHAFT AND/OR SEAL ID WITH LIGHT OIL. Slide new seal onto shaft until carbon rests on ceramic. Make sure carbon does not fall out of seal head, particularly if shaft is up.
- 5. Place spring and washer over shaft. Depress and hold while snap ring is installed in groove. Snap ring may be placed over shaft and slid down shaft to depress spring.
- 6. INSTALL IMPELLER KEY, IMPELLER AND IMPELLER LOCK BOLT WITH WASHER.
- 7. MOUNT VOLUTE WITH NEW GASKET. Note: Use care and tighten all bolts evenly. Rotate shaft frequently and check for rubbing. Several adjustments may be needed.
- 8. AFTER RECONNECTING ELECTRICAL CONNECTIONS as tagged, prime according to instructions. Make sure all air is removed.
- 9. JOG SWITCH to determine if rotation is correct. If not, reconnect.
- 10. REPRIME AND RETURN TO SERVICE.

PARTS	LIST	\
PARIS	LIGI	
A.	Motor with Base	Contact Factory
8.	1/2" Pipe Plug - 316SS - 2 req'd	0561
C.	Motor Bracket	0292
D.	Volute Bolts - (8 reg'd)	0724
E.	Impeller Shaft Key	0305
F.	Volute Gasket	0301
G.	End Plate Gasket (optional)	0302
H.	End Plate Bolt (4 reg'd)	0914
J.	Impeller (specify diameter)	
-	A 10SS	0296
	B 15SS	0298
K.	Volute w/pipe plugs	1
	A 1055	0295-1
	B 15SS	0297-1
L.	Impeller Bolt	0303
M.	Impeller Washer	0304
N.	1/8" Pipe Plug - 316SS - (2 req'd)	0559
o.	Double Seal End Plate (optional)	0293
P.	Shalt w/Set Screws	0233
•••	T.21 Seal	0294-1
	T. 9 Seal	0294-2
R.	Seal with Seat	0237.2
•••	Viton	0122
	Tellon (T9)	0123
S.	Motor Bolts	0586
T.	Snap Ring	0372
U.	Motor Shalt Key	0135
	(Not shown)	0 · · · · · · · ·
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10 KM		19672 - 81h 51.00 954.76 19672 - 81h 67.00 954.76 19672 - 81100 10 10 10 10 10 10 10 10 10 10 10 10
Bulletin	/ail	23.7. (70,10,7"
#IN 106	Aldi	5000m ³ Tel: (707) 0.746.9260
		2~ 14.

DESCRIPTION

The Hersey Model MVR sizes 30-50-100 and 160 Magnetic Drive Turbine Meters with exclusive patented Retro Thrust* feature provides for longer life over a wider range of accuracies. At low flow rates the rotor's tungsten carbide thrust bearing floats against the sapphire bearing located in the meter casing. As flow rates increase the retrothrust feature allows the rotor to float away from the sapphire. At high flow rates the rotor's stainless steel shaft floats against the upstream sapphire bearing, thereby minimizing wear and thus assuring extended operating life.

The Dura-Dri TM Register is permanently hermetically sealed between a glass dome and metal housing.

The register cover is constructed of cycolac plastic. The register is held in place by a polypropylene clamp band which allows for positioning the register in the most convenient reading position. Registers are available with center sweep hand, straight reading indicating cubic feet, U.S. gallons, cubic metres and litres.

The measuring chamber is composed of a noryl plastic inlet hub, polypropylene rotor and strainer on the MVR-30-50 and 100. The measuring chamber on the MVR-160 is composed of a noryl plastic inlet hub, polypropylene rotor and stainless steel ring strainer.

The strainer screws into the inlet hub. The MVR will operate at temperatures from 32° to 130°F, and will operate with particles of sand in the water.

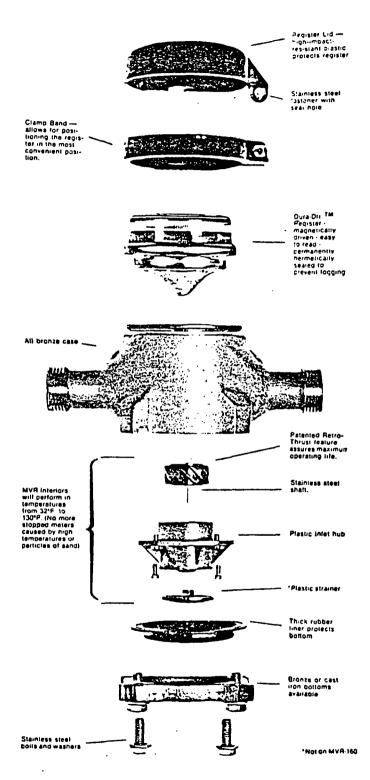
Outer cases are time-proven cast bronze.

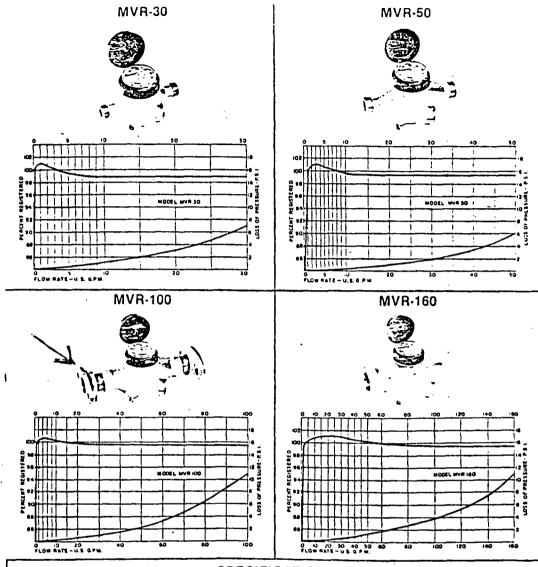
Bottom plates are available in both bronze and enamel coated cast iron. Bronze only on the MVR-160.

A full Buna-N rubber liner for the MVR 30-50 and 100 bottoms and an EPT liner for the MVR-160 are provided for corrosion protection.

Meter case is tapped to receive 4 stainless steel casing bolts and washers which secure the bottom to the meter housing.

The Hersey MVR Magnetic Drive Turbine Meters are also available in compact models with varying spud sizes.





SPECIFICATIONS

Magnetic Drive Turbine Meters, sizes 30-50-100 and 160 shall have bronze outer cases. The register lid and clamp band shall be made of high-impact-resistant plastic to protect the register. The clamp band shall hold the register and lid in place by means of one stainless steel fastener and nut. Both the fastener and clamp band shall be drilled to receive sealing wire. The clamp band shall allow for positioning the register in the most convenient reading position.

The register shall be completely separated from the water-way and shall be available with center sweep hand, straight reading indicating cubic feet or U.S. gallons, cubic metres or litres. The register shall be permanently hermetically sealed between a glass dome and metal housing. The register shall be driven by a ceramic magnet.

The measuring chamber on MVR 30-50-100 shall be composed of a plastic intel hub, rotor and strainer whereas the measuring chamber on the MVR 160 shall be composed of a plastic intel hub and rotor and a stainless steel ring strainer. The chamber shall be held in place with (4) four stainless steel screws. It shall not be adversely affected by temperatures from 32°F. to 130°F, or by particles of sand. The meter shall incorporate a patented Retro-Thrust' design to assure maximum operating life. The rotor thrust bearings shall be sapphires and the bushings, graphitar.

The bottom plate shall be either bronze or enamel coaled cast iron on the MVR 30-50-100, bronze only on the MVR 160. Both shall be protected with a thick rubber liner. The meter case shall be tapped to receive (4) four stainless steel bolts and washers which secure the bottom to the meter housing.

ELECTRICAL BILL OF MATERIALS

Item	Description and Part No.	Reference Designator	Qty.
1	Fuse, dual element time delay. Bussman #FRS-R-15	Part of FX1	6 (3 spares)
2	Motor starter, Nema size O coil voltage: 24 VAC. Furnas #14 CF 32 AJ	MS1, MS2	2
3	Melting alloy, standard trip heater for Nema size O starter Furnas #H31 (7.70 - 8.54 amp)	MS1	3
4	Melting alloy, standard trip heater for Nema size O starter Furnas #H25 (4.01 - 4.50 amp)	MS2	3
5	Power monitor, 3 phase, 480 VAC. provides over voltage, under voltage and phase sequence protection. Time Mark #C269-480	KOE-2	1
6	Power monitor, 3 phase, 240 VAC provides over voltage, under voltage and phase sequence protection. Time Mark #B269-240	KOE-1	1
7 .	Two position maintained oiltight selector switch. Cutler-Hammer #10250T3011	SW1	1
8	Three position maintained oiltight selector switch. Cutler-Hammer #10250T1323	SW2	1
9	Transformer 480/240, 50 va, Jefferson #637268	Т1	1
10	Transformer 480/24, 50 va, Jefferson #240201	T2	1
11	Terminal with 600 v clearance, Buchanan #525	TB1, TB2, TB3	32
12	Fuse/switch terminal block. Buchanan #352	Part of TB1	1
13	Fuse, dual element time delay. 1 amp 500 vol, 13/32" x 1-1/2" KTK 1 amp	Part of TB1	2 (1 spare)
14	Enclosure, Nema 12. 30" H x 24" W x 8" D Hoffman #A-302408LP	N/A	1

Item	Description and Part No.	Reference Designator	Qty.
15	Circuit breaker, 3 pole, 30 amp, 480 vac. Westinghouse #EHC3030	CB1	1
16	Line terminal lugs, Westinghouse #624B100G02	Part of CBl 1	pkg. of 3
17	Fuse block, 3 pole, 480 VAC (suitable for buss FRS series dual element time delay fuses) Taylor #60303	FX1	1
18	Mechanical interlock for Nema size O starters. Furnas #49CCF22H	Part of MS1 and MS2	1
19	Electrical auxiliary interlock for Nema size O starter with one N.C. contact	Part of MS1 and MS2	2
20	Contact block with pressure terminals, one N.O., one N.C. Cutler-Hammer #10250T1	Block 2, 3, 4, 5, 6 and 7 for SW1	6
21	Contact block with pressure terminals, two N.O. Cutler-Hammer #10250T2	Block 1 for SW1	2
22	Legend plate, blank Cutler-Hammer #10250TS36	Part of SW1	1
23	Legend plate, hand-off-auto. Cutler-Hammer #10250TS51	Part of SW2	1
24	End block for terminal strip. Buchanan #330	Part of TB1, TB2, and TB3	5
25	Subpanel 27"H x 21"W. Hoffman #A-30P24	N/A	1
26	Drip shield kit. Hoffman #A-DK24A	N/A	1

Innova 45 Superiodes time of May, 1975

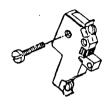
INSTERUCTED NESS

AUXILIARY ELECTRICAL INTERLOCK FOR STARTERS AND CONTACTORS

14 8 40 OPEN & NEMA 1
512 00-0-1-1P-114

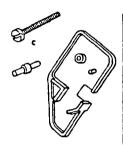
Date

JANUARY, 1978



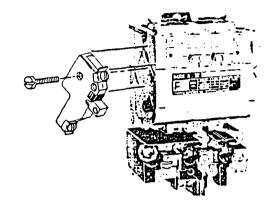
CONTENTS OF

- N.O. Kis No. 49054682NO E Normally Open Interlock F Mounting Screw
- N.C. Kit No. 49054682NC E Normally Closed Interlock F Mounting Screw



CONTENTS OF TANDEM MOUNT KIT KIT No. 49L106889

- A Switch Tig-Pin
- 8 2 Insulators
- C. Mounting Screw 6/32

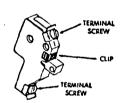


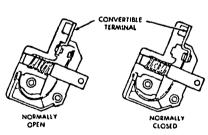
SINGLE INTERLOCK MOUNTING

Interlock may be mounted on either side of control. Hold interlock on side of the control as shown above and secure in place with mounting screw. Make sure the interlock lines up with the aligning notches on the control.

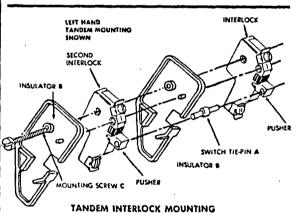
CONVERTING NORMALLY OPEN TO NORMALLY CLOSED

 Remove both terminal screws and clip as shown. Remove interlock cover.





Turn convertible terminal to position desired for Normally Open or Normally Closed as shown above. Replace cover and terminal screws.



NOTE: If interlock was previously mounted, the mounting screw will have to be removed.

- 1. Place Switch Tie-Pin A on Pusher of interlock.
- Hold second interlock in place making sure Tie-Pin A and Insulators B are aligned. Secure with Mounting Screw C furnished in Tandem Mounting Kit.

NOTE: For right hand mounting insert mounting screw C from opposite side.

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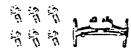
Innova 45

HORIZONTAL MECHANICAL INTERLOCK FOR STARTERS AND CONTACTORS KIT NO. 49CCF22HP & KIT NO. 49CCF22H

49-HCCF22H Cal. No or Ciass Series NOVEMBER, 1972

KIT 49CCF22HP





CONTENTS OF KIT

1 PANEL 6 SCREWS (10-32x14) 1 INTERLOCK ASSEMBLY

KIT 49CCF22H





CONTENTS OF KIT 6 SCREWS (10-32+14) 1 INTERLOCK ASSEMBLY

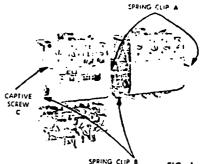
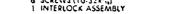


FIG. 1





- 1. Mount units (Starters or Contactors) on panel if supplied with kit or drill holes as required. See Fig. 4.
- 2. Remove arc box cover by pushing Spring Clip A up and Clip B down as shown in Fig. 1.
- 3. Remove arc box by loosening two captive screws C on arc box, Fig. 3.

NOTE: If auxiliary interlocks are used between the units (maximum of two) they must be installed on the proper arc box before it is positioned on its base.

- 4. Hold interlock assembly in unit as shown in Fig. 2. CAUTION: Be sure interlock assembly is positioned as shown. Large metal side plate must be down and "T" shaped interlock parts must be up.
 - 4.1 Place left arc box on base. Fig. 3.
 - 4.2 Check for no binding.
 - 4.3 Tighten two captive screws C.
- 5. Assemble the right hand arc box and secure with the two captive screws C.
- 6. Check manually to be sure devices operate free and correctly. Only one unit should close at a time.
- 7. Replace arc box cover and return the spring clips A and B to their original positions.

WIRING

Wire the units as required for the installation. It is recommended that normally closed electrical interlock kits be used in addition to the mechanical interlock kit to conform to standard wiring practices and NEMA standards.



MOUNTING PANEL

FIG. 2

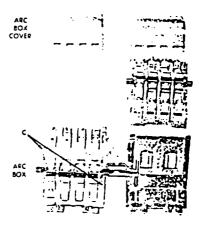


FIG. 3

FURNAS ELECTRIC COMPANY . BATAVIA, ILLINOIS



Innova:45 Supersedes liese of May, 1981

REPLACEMENTE PARTS

MAGNETIC CONTROLS

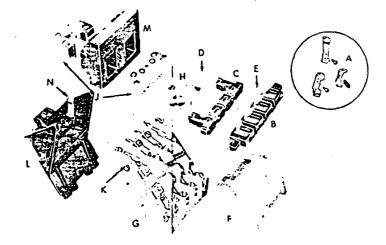
File Mo. 14-GCF

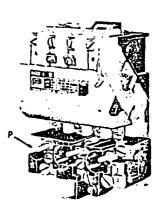
Cat. No. or Class Series

14BF, 14CF, 14DF, 14EF
40BF, 40CF, 40DF, 40EF

Size OO, O, 1, 1P, & 124

JUNE, 1982

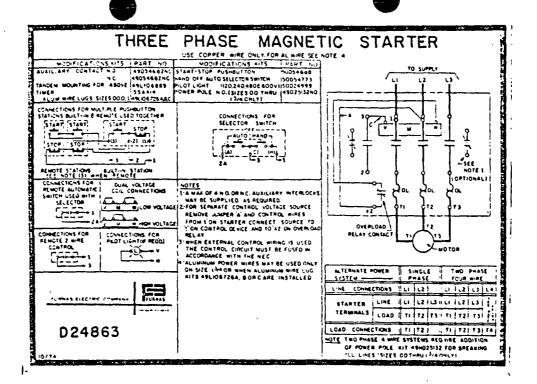




			PART NUMBER				
(TEM		PART ^I NAME	1485 Size 00	- 14CF Size 0	14DF Size 1	14EF Sico 1P & 144	
Α	Contacts & Spring	One complete pale - Power Pole	75BF14	75CF14	75DF14	75EF14	
В	Cross Arm (less	Interlock Pole	75AF14 D54670 001	75AF14 D54670 001	75AF14 D54670 001	75AF14 D54670 001	
c	Cross Arm Base		D54873 001	D54873 001	D54873 001	D54873 001	
Ď	Cross Arm Spring	35	D24826 001	D24826 001	D24826 001	D24826 001	
E	Cross Arm Screw	•	025013 001	D25013 001	D25013 001	D25013 001	
F	Contact Board Co	over	D73062 001	D73062 001	D73062 001	D73062 001	
G	Contact Board (le	ss contacts)	D73116 022	D73116 022	D73116 022	D73116022	
н	Armature Spring	Clip	024817 001	D24817 001	D24817 001	D24817 001	
j	Magnet and Arm	ature	D25551 001	D25551 001	D25551 001	D25551 001	
K	Contact Board Sc	rew	D24827 001	D24827 001	D24827 001	D24827 001	
L.	Base		D74400 001	D74400 001	D74400 001	D74400 001	
M	1	120/208-240 Volts 50 Hz. 110 Volts	•	75D73070A	75D73070A	75D73070A	
	208	3-240/440-480 Volts 220 Volts	1	75D73070C	75D73070C	75D73070C	
	550	0-600 Volts 550 Volts		75D73070E	75D73070E	75D73070E	
N	Coil Spring Clip	,	D24815001	D24815001	D24815001	D24815001	
	ĺ	Melting alloy (std.)	48DC11A2	48DC11A2	48DC11A2	48EC11A2	
		S Pole	48DC31A2	48DC31A2	48DC31A2	48EC31A2	
Р	Overload Relays	Standard Bimetal	48DC17AA2	1	48DC17AA2	1	
•		\$3 Pole	48DC37A2	48DC37A2	48DC37A2	48EC37A2	
		Amb. Compensated Bimetal	48DC18AA2	48DC18AA2	48DC18AA2		
		Amb. Compensated Smooth 3 Pole	48DC38A2	48DC38A2	48DC38A2	48EC38A2	

NOTE: When ordering replacement parts, give catalog number of control and part name and number.

Furnas Electric Company - Batavia, Illinois, U.S.A.



MAGNET COIL RATING			1816	PECTED
VOLTS HERTZ H "Standard Trip	" HEA	TER EL		
FOR MELTING				
Heaters shown in the ta- ble provide a maximum trip rating of 125% of			Heater Code	Max. Rat. of Prot. Device
Detay willer is solidord	Min.	.39 .44	No. H1 H2	<u>_</u>
ers one code number lower than specified in the table, which give a	.40 .45 .51 .56	.50 .55 .61	H3 H4 H5	2 2 2
maximum trip rating of approximately 115%.	.62	68 74 .82	H6 H7 H8	3 3 3
The tripping current of any heater in a 40° C ambient is 25% greater than the lower value of	.75 .83 .93 1.03 1.14	1.02 1.13 1.29	H13 H11 H10 H8	2222333334445556
table.	1,30 1,46 1,58	1.45 1.57 1.74	H13 H14 H15	5 5 6
Starters do not provide protection from short circuits. A protective device should be provided in accordance with the N.E.C. (C.E.C. in Canada) and not exceed the values shown in the table.	1,75 1,93 2,19 2,35 2,63 2,98 3,26 3,61 4,01	3.60 4.00 4.50	H16 H17 H18 H20 H21 H22 H23 H24 H25	6 8 10 10 12 12 15 15
PROTECTIVE DEVICE: *Fuse or inverse time cir-	4.51 5.11 6.33 6.82	5.10 6.32 6.81 7.69	H26 H28 H29 H30	25 25 30
cuit breaker. Fuses above 600 amps are Class "L".	7.70 8.55 9.55	8.54 9.54 10.7	H32 H33	30 35 40 40
tInstantaneous trip circuit breaker.	10 B 12.2 12.8 14.1 15.0 17.0	12.1 12.7 14.0 14.9 16.9 18.1	H34 H35 H36 H37 H38 H39	45 60 60



3-PHASE POWER MONITOR

MODEL 269

INSTALLATION **INSTRUCTIONS**

(CAUTION)

POTENTIALLY HAZARDOUS VOLTAGES ARE PRESENT AT THE TERMINALS OF THE MODEL 269. ALL ELECTRICAL POWER SHOULD BE REMOVED WHEN CONNECTING OR DISCONNECTING WIRING OR MAKING ADJUSTMENTS TO THE WITT. THE UNIT SHOULD BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL.

INSTALLATION:

THE THREE PHASE WIRING SHOULD BE CONNECTED TO THE TERMINALS MARKED A, B AND C. THE CONTROL WIRING WILL BE CONNECTED AT THE OPPOSITE END OF THE UNIT TO THE TERMINALS WITH THE CONTACT HARRINGS. THE MARRINGS SHOWN OF THE UNIT ARE THE FALLED CONDITION OF THE CONTACTS. IF "-E CONTACTS GO NOT YPANSFER WHEN POWER IS APPLIED (INDICATOR LITES OFF). CHECK THAT ALL THREE PHASES ARE PRESENT AND OF THE CORPECT VOLTAGE. IF ALL PHASES ARE CORRECT, ROTATE THE "UNDER VOLTS" ADJUSTMENT COUNTER-CLOCKWISE AND THE "OVEP VOLTS" ADJUSTMENT CLOCKWISE. IF THE CONTACTS STILL DO NOT "HANSFER, REMOVE POWER FROM THE UNIT. REVERSE TWO OF THE THREE PHASE WIRES THEN REAPPLY POWER. THE CONTACTS SHOULD THEN TRANSFER TO THE OPERATING CONDITION (INDICATOR LIVES OFF).

ADJUSTMENT:

BOTH THE UNDER AND OVER VOLTS ADJUSTMENTS ARE SCALED AT FIVE VOLT INCREMENTS. SET EACH ADJUSTMENT TO THE DESIRED VOLTAGE TRIP LEVEL, THEN SET THE DELAY SECONDS ADJUSTMENT TO THE MINIMUM TIME DELAY NECESSARY TO PREVENT HUISANCE TRIPPING.

11440 E. PINE

19181438-1220 TULSA, OK 74116



APPENDIX B

Laboratory Analytical Data

Analytical Serv PAGE 1 IAR # 85-07-015 RECEIVED: 07/02/85 03/20/86 12:00:56 REPORT Radian PREPARED Radian Analytical Services TO B1. 4 BY 8501 MoPac Blvd. P. D. Box 9948 Austin Austin, Texas 78766 CERTIFIED BY ATTEN Robt. Wallace/Will Boettner ATTEN PHONE (512) 454-4797 CONTACT GRIMSHAW SAMPLES 3 CLIENT MAXIN COMPANY Maxin Eng. FACILITY Duplicate of report of 07/11/85. WORK ID No. End of Foundation Excav. TAKEN Footnotes and Comments TRANS Fed Ex. 436499766 TYPE Dily Water * Indicates a value less than 5 times the detection limit. P. D. # 229-025-01-20 Potential error for such low values ranges between INV. # 6108 50 and 100%. @ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present. Analytical Serv TEST CODES and NAMES used on this report SAMPLE IDENTIFICATION 03 Trip Blank VOA EX 625 Extraction only - 625 BN/A IFB BS BNA Screen by IFB method 11 #6 M625 A Method 625 Acid Compounds 12 #7 M625 B Method 625 Base/Neutrals MSNS S GCMS Characterization-ABN

MSNS V GCMS Characterization-VDA

MS 624 EPA Method 624/GC-MS

PAGE 2 RECEIVED: 07/02/85

Analytical Serv REF RESULTS BY TEST

LAB # 85-07-015

TEST CODE	Sample 11 (entered units)	
EX_625	07/02/85	
date complete IFB_BS date complete	07/01/85	

Σ	GE	3
п	ar.	v

Analytical Serv

REPORT

LAB # 85-07-015

RECEIVED: 07/02/85

Results by Sample

SAMPLE ID #6

TEST CODE M625 A NAME Method 625 Acid Compounds Date & Time Collected 07/01/85 Categoru

DATA FILE 2CU07015C11 CONC. FACTOR _____11

DATE EXTRACTED 07/02/85 DATE INJECTED 07/05/85

2-nitrophenol ND :

ANALYST ____WA

VERIFIED BY LAK INSTRUMENT ____ COMPOUNDS DETECTED __C

NPDES SCAN COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 11A 21A 4-nitrophenol ND 2,4,6-trichlorophenol ND : 58A 4-chloro-3-methylphenol ND 1 / 5A 88 22A 59A 2.4-dinitrophenol ND 24A 1A 2-chlorophenol ND: 60A 2-methyl-4,6-dinitrophenol ND 2A 31A 2.4-dichlorophenol ND : 64A pentachlorophenol <u>ND</u> 2.4-dimethylphenol ND : phenol ___ NE BΑ **34A** 10A 65A

SURROGATE RECOVERIES

6A

57A

RESULT	COMPOUND	CODE	SCAN
d5-pheno1 <u>33%</u>		AS1	448
luorophenol <u>26%</u>	2-f	AS2	340
bromophenol <u>100%</u>	2,4,6-tri	AS3	1075
d3-phenol		AS4	•

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. ug/1 unless otherwise specified. All results reported in

CORPORATION

PAGE 4

RECEIVED: 07/02/85

Analytical Serv

Serv REPORT Results by Sample

LAB # 85-07-015 Continued From Above

SAMPLE ID #6

FRACTION 11A TEST CODE M625 A NAME Method 625 Acid Compounds
Date & Time Collected 07/01/85 Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

Analytical Serv

REPORT

LAB # 85-07-015

RECEIVED: 07/02/85

Results by Sample

SAMPLE ID #6 FRACTION 11A TEST CODE M625 B NAME Method 625 Base/Neutrals

Date & Time Collected 07/01/85 Category

		_ caveyory		ATABO	eu <u>v//</u>	niicr	x i tine of	Date				
		VERIFIED COMPOUNDS DETEC	WA	LYST	ANA INSTRU			DATE EXTRACTED DATE INJECTED	07015C11 11		TA FIL FACTO	
٢	RESUL	COMPOUND	(EPA	SCAN	NPDES	RESULT	COMPOUND		EPA	SCAN	NPDES
<u>}</u>		itrosodimethylamine	N-ni	61B		41B	1200	acenaphthene		1 B	955	1 B
<u>)</u>	- 14	itrosodiphenylamine	N-nii	62B		! 43B	ND	benzidine		5B		4B
ž	<u>' N</u>	osodi-n-propylamine	N-nitros	63B		. 42B	<u>ND</u>	,4-trichlorobenzene	1,2,	88		46B
<u>)</u>	N	thylhexyl)phthalate	bis(2-et	66B		138	ND	hexachlorobenzene		9B		33B
<u>}</u>	N	ıl benzyl phthalate	buty	67B		15B	ND	hexachloroethane		12B		36B
<u>}</u>		di-butyl phthalate	C	68B		26B	ND	2-chloroethyl)ether	bis(2	188		11B
<u>)</u>		i-n-octyl phthalate	di-	69B		! 29B !	<u>ND</u>	2-chloronaphthalene	a	20B		16B
<u>}</u>	N	diethyl phthalate		70B		24B	ND	1,2-dichlorobenzene	1	25B		20B
<u> </u>	<u> </u>	dimethyl phthalate	d	71B		25B	ND	1.3-dichlorobenzene	1	26B		218
1	72	izo(a)anthracene A	b en z	72B	<u>1617</u>	5B	ND	1,4-dichlorobenzene	1	278		228
-	77	benzo(a)pyrene	•	73B	<u> 1934</u>	68	ND	3'dichlorobenzidine	3, 3	28B		23B
! -	<u> </u>	(b)fluoranthene *	benzo (74B		7B	ND	2,4-dinitrotoluene		35B		27B
i -	85	(k)fluoranthene *	benzo (75B	1848	9B	ND	2.6-dinitrotoluene		368		28B
<u>.</u>	<u> 79</u>	chrysene A		76B	<u> 1623</u>	188	ND	2-diphenylhydrazine	1,2	37B		29B
<u>.</u>	100	acenaphthylene		77B	<u>925</u>	2B	<u>1700</u>	fluoranthene		39B	1380	31B
-	110	anthracene B		78B	1194	3B	ND	phenyl phenyl ether	4-chlorop	40B		17B
						_	•					

PAGE 6 RECEIVED: 07/02/85 Analytical Serv Results by Sample

LAB # 85-07-015 Continued From Above

SAMPLE	ID <u>#6</u>			CTIO	N <u>11A</u> Time Co			<u>M625 B</u> 01/85	NAME <u>Method 625 Base/Neutrals</u> Category
14B	4	41B	4-bromophenyl phenyl eth	er _	ND	: 8B	2483	79B	benzo(ghi)perylene <u>200</u>
128	4	42B	bis(2-chloroisopropyl)eth	er	ND	32B	1035	вов	fluorene <u>1400</u>
10B	4	43B	bis(2-chloroethoxy)metha	ne _	ND	44B	1188	81B	phenanthrene B <u>2400</u>
348	;	528	hexachlorobutadie	ne _	ND	19B		82B	dibenzo(a,h)anthracene N
358		53B	hexachlorocyclopentadie	ne	ND	37B	2353	838	indeno(1,2,3-cd)pyrene <u>220</u>
388		54B	isophoro	ne _	ND	458	<u>1417</u>	84B	pyrene <u>1500</u>
39B _	<u>678</u>	55 B	naphthale	ne _	8000	i -			
40B	5	56 B	nitrobenze	ne _	ND	1			

SURROGATE RECOVERIES

RESULT	SCAN C
d5-nitrobenzene <u>100%</u>	<u>571</u>
2-fluorobiphenyl <u>55%</u>	845
d14-terphenyl <u>73%</u>	1446
d10-hinhanul	1

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in uq/l unless otherwise specified. ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84). # = benzo(b)fluoranthene and benzo(k)fluoranthene co~elute. A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

Serv REPORT Results by Sample

LAB # 85-07-015 Continued From Above

SAMPLE ID #6

FRACTION 11A TEST CODE M625 B NAME Method 625 Base/Neutrals
Date & Time Collected 07/01/85 Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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RECEIVED: 07/02/85

Analytical Serv

REPO:

LAB # 85-07-015

Results by Sample

SAMPLE ID #6

FRACTION 11A TEST CODE MSNS S NAME GCMS Characterization-ABN Date & Time Collected 07/01/85 Category

	nare a time collects	n <u>allation</u>	. (8)	sedoud
CHRO # 20070150 SAMPLE SIZE 920 ml	DATE ANALYZED 07/05/85	UNITS ug/1		VERIFIED BY LAK
SCAN	COMPOUND	RESULT	CONF LEVEL	REF CMPD
_785	2-methylnaphthalene	3200		
980	dibenzofuran	560		
523	benzene, 1-propenyl-	4500		
532	1h-indene	8100		
641	cucloprop[a]indene,1,1a,6,6a-tet	ra		
	hydro	870		
_648	cucloprop[a]indene, 1, 1a, 6, 6a-tet	ra		
	hydro	1000		
802	naphthalene,1-methyl-	3700		
859	1,1'-biphenyl	1800		
884	Naphthalene, 2, 7-dimethyl	1600		
<u>897</u>	naphthalene, 2, 3-dimethyl	2400		
1069	1h-phenalene	660		
1124	914-fluorene,4-methyl-	550		
1167	dibenzothiophene	510		
1271	phenanthrene, 3-methyl-	1300		(4)

RECEIVED: 07/02/85

Analytical Serv

REPORT

LAB # 85-07-015

Results by Sample

SAMPLE ID #6

FRACTION 11B TEST CODE MSNS S NAME GCMS Characterization-ABN
Date & Time Collected 07/01/85 Category

CHRO # <u>2CU07015C1</u> SAMPLE SIZE <u>920 ml</u>	DATE ANALYZED 07/05/85	UNITS ug/1		VERIFIED BY LAI	<u>K.</u>
SCAN	COMPOUND	RESULT	CONF LEVEL	REF CMPD	
<u>1285</u>	phenanthrene, 4-methyl	1700			
<u>1266</u>	phenanthrene, 3-methyl	1200			
<u>1314</u>	naphthalene, 2-pheny1	840			

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Analytical Serv

REPORT

LAB # 85-07-015

Results by Sample

SAMPLE ID #7

FRACTION 12A

TEST CODE MSNS V

NAME GCMS Characterization-VOA

Date & Time Collected 07/01/85

Category

CHRD # 4CQ07015V2 SAMPLE SIZE 50 ul

DATE ANALYZED 07/02/85

UNITS uq/1

VERIFIED BY LAK

SCAN

COMPOUND

RESULT

CONF REF LEVEL CMPD

483

total xylenes

2200

526

2,3-dihudro-1h-indene

2500

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REPORT

LAB # 85-07-015

Analytical Serv REPORESULTS by Sample

SAMPLE ID	<u>#7</u>		ION <u>12A</u> & Time C	TEST CODE Collected <u>07/</u>			C-MS
DATA FI CONC. FACT		07015V12 DATE INJECTED 100	07/02/E	85 ANA INSTRU	-		ED BY LAK
NPDES SCAN	EPA	COMPOUND	RESULT	NPDES SCAN	EPA	COMPOUND	RESULT
3V <u>251</u>	. 4V	benzene	1500	i 17V	32V	1,2-dichloropropa	ne <u>ND</u>
67	67	carbon tetrachloride	ND	: 18V	33V	cis-1.3-dichloropropyle	ne <u>ND</u>
7 V	7 V	chlorobenzene	<u>ND</u>	18V	33V (trans-1,3-dichloropropyle	ne <u>ND</u>
15V	10V	1,2-dichloroethane	ND	19V <u>425</u>	38V	ethylbenze	ne <u>2000</u>
27V	11V	1,1,1-trichloroethane	ND	i ! 22V	44V	methylene chlori	de <u>Nü</u>
14V	13V	1,1-dichloroethane	ND	210	45V	· methyl chlori	de <u>ND</u>
28V	14V	1,1,2-trichloroethane	ND	200	46V	methyl bromi	de <u>ND</u>
23V	15V	1,1,2,2-tetrachloroethane	ND	5V	47V	bromofo	rm <u>ND</u>
9 V	16V	chloroethane	ND	120	48V	dichlorobromometha	ne <u>ND</u>
10V	19V	2-chloroethylvinyl ether	ND	300	49V	trichlorofluorometha	ne <u>ND</u>
11V	23V	chloroform	ND	8V	51V	chlorodibromometha	ne <u>ND</u>
16V	29V	1,1-dichloroethylene	ND	247	85V	tetrachloroethyle	ne <u>ND</u>
24V	307	1,2-trans-dichloroethylene	ND	25V <u>373</u>	86V	tolue	ne <u>3000</u>
		·		297	87V	trichloraethyle	ne <u>ND</u>
				317	887	vinyl chloric	te <u>ND</u>

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Analytical Serv Results by Sample

LAB # 85-07-015

Continued From Above

SAMPLE ID #7

FRACTION 12A

TEST CODE MS 624 Date & Time Collected 07/01/85

NAME EPA Method 624/GC-MS

Category

SURROGATE RECOVERIES

ESULT	COMPOUND	CODE	SCAN
90%	d4-1,2-dichloroethane	VS1	145
95%	d8-toluene	VS2	370
91%	bromofluorobenzene	VS3	456

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in ___uq/l unless otherwise specified. ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84). BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

NonReported Work

LAB # 85-07-015

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

03B | DUP624

PAGE 1 ATTOM RECEIVED: 10/10/85	nalytical Serv REPORT LAB # 85-10-058 03/20/86 12:03:23
REPORT Radian TO B1 4 Austin ATTEN Robert Wallace CLIENT LINCOLN SAMPI COMPANY Lincoln Properties FACILITY Congress Av.	PREPARED Radian Analytical Services BY 8501 MoPac Blvd. P. D. Box 9948 Austin, Texas 78766 CERTIFIED BY ATTEN PHONE (512) 454-4797 CONTACT GRIMSHAW LES _3
WORK ID pre- and post-treatment TAKEN BJH TRANS BJH TYPE P. O. # 229-025-05-20 INV. # 6724	**Sample was yellow in color. B-Compound detected in Reagent Blank at less than method MDL: background correction not performed. NA-Not applicable. Duplicate of report of 10/31/85. Footnotes and Comments
	* Indicates a value less than 5 times the detection limit. Potential error for such low values ranges between 50 and 100%. @ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present.
SAMPLE IDENTIFICATION O1 Con-1 O2 Con-2 O3 Con-3	Analytical Serv TEST CODES and NAMES used on this report AG E Silver, ICPES M625 A Method 625 Acid Compounds AS HA Arsenic Hydride M625 B Method 625 Base/Neutrals BA E Barium, ICPES MN E Manganese, ICPES BOD5 Biological Oxygen Demand MS 624 EPA Method 624/GC-MS B E Boron, ICPES NI E Nickel, ICPES CD E Cadmium, ICPES OPO4 A Orthophosphate CH2O Formaldehyde PB GA Lead, low level CL IC Chloride IC PH A pH COD A Chemical Oxygen Demand SE HA Selenium Hydride CR E Chromium, ICPES SO4 IC Sulfate IC CU E Copper, ICPES ZN E Zinc, ICPES EX 525 Extraction only - 625 BN/A

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Analytical Serv REF RESULTS BY TEST

LAB # 85-10-058

NEGETVES. 10710700		MEDULIO BI	1201		
TEST CODE	Sample <u>01</u> (entered units)	Sample 02 (entered units)	Sample 03 (entered units)		
AG_E	0. 004*	0. 003*			
I Ug 7m1 AS_HA	0. 007 *	0. 007*			
BA_E	0. 18	0. 084			
BOD5	. 4	1			
B_E	1. 1	0. 23*			
CD_E	<0.002	CO. 002			
Ug 7m1 CH2O	0. 2	0. 2**	·	•	
mg/L CL_IC	72	77			•
COD_A	110	7			
CR E	0.013*	0. 010*			
: ug/m1 : CU_E	0. 008	0.001*			
Ug/m1	10/15/85	10/15/85	10/15/85		
date complete :	<0.0002	<0. 0002			
ug/m1 MN_E ug/m1	0. 12	0. 016			
-					

PAGE 3 RECEIVED: 10/10/85	Analytic	:al Serv RcPOFT RESULTS BY TEST	LAB # 85-10-058 CONTINUED FROM ABOVE
NI_E ug/m1 OPO4_A mg/L_as P PB_GA ug/m1 PH_A pH_Units SE_HA ug/m1 SO4_IC mg/L ZN_E ug/m1	0.017 1.5 <0.002 8.16 <0.002 740 0.003*	0. 003* 0. 18 0. 002 8. 25 0. 002 345 0. 003	

Analytical Serv

LAB # 85-10-058

RECEIVED: 10/10/85

Results by Sample

SAMPLE ID Con-1

FRACTION <u>Old</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u> Date & Time Collected 10/03/85

Category ____

DATA FILE 2CU10058C01 CONC. FACTOR 1

DATE EXTRACTED 10/15/85 DATE INJECTED 10/23/85

ANALYST ____SF INSTRUMENT 32 VERIFIED BY LAK

COMPOUNDS DETECTED __O

•								
RESULT	COMPOUND	EPA	PDES SCAN	RESULT	COMPOUND	EPA	SCAN	NPDES
ND	4-nitrophenol	58A	7A	ND	2,4,6-trichlorophenol	21A		11A
ND	2,4-dinitrophenol	59A	5A	ND	4-chloro-3-methylphenol	22A		88
ND	2-methy1-4,6-dinitrophenol	60A	4A	<u>ND</u>	2-chlorophenol	24A		1A
ND	pentachlorophenol	64A	9A	ND	2,4-dichlorophenol	31A		2A
MD	phenol	65A	10A	ND	2,4-dimethylphenol	34A		ЗА
				ND	2-nitrophenol	57A		6A

SURROGATE RECOVERIES

RESULT	COMPOUND F	CODE	SCAN
84	d5-phenol_	AS1	446
42	2-fluorophenol_	A52	333
82	2,4,6-tribromophenol	ESA	1065
na	d3-phenol	AS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in

uq/l unless otherwise specified.

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Analytical Serv

REPORT

Results by Sample

LAB # 85-10-058 Continued From Above

SAMPLE ID Con-1

FRACTION <u>O1G</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>

Date & Time Collected <u>10/03/85</u> Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).
BL = detected in reagent blank; background subtraction not performed.
J = estimated value; less than method detection limit.
CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

Analytical Serv

REPORT

LAB # 85-10-058

RECEIVED: 10/10/85

Results by Sample

SAMPLE ID Con-1 FRACTION O1G TEST CODE M625 B NAME Method 625 Base/Neutrals

Date & Time Collected 10/03/85 Category

		eguig	7	00/00	en TAL	DITECO	X IIIIE CO	Date (
_	_	VERIFIED		LYST MENT	ANA INSTRU			DATE EXTRACTED DATE INJECTED	<u>J10058C01</u>		TA FIL	
T	RESUL		COMPOUND	EPA	SCAN	NPDES	RESULT	COMPOUND		EPA	SCAN	NPDES
Ω.		ethylamine	N-nitrosodimet	61B		41B	7	acenaphthene		1 B	946	1 B
<u>0</u>		henylamine	N-nitrosodiphe	62B		43B	ND	benzidine		5B		4B
<u>3</u>		ropylamine	N-nitrosodi-n-pro	63B		428	<u>ND</u>	,4-trichlorobenzene	1,2,	88		46B
<u>7</u>)phthalate	bis(2-ethylhexyl)p	66B	<u> 1611</u>	13B	<u>ND</u>	hexachlorobenzene		9B		33B
<u> </u>	<u> </u>	phthalate	butyl benzyl p	67B		15B	ND	hexachloroethane	,	12B		36B
<u>3</u>	1	phthalate	di-butyl p	68B	1276	26B	ND	2-chloroethyl)ether	bis(2	1 8B		11B
<u>3</u>	<u></u> t	phthalate	di-n-octyl p	69B		29B	ND	2-chloronaphthalene	2	20B	-	16B
2		phthalate	diethyl p	70B		248	ND	1,2-dichlorobenzene	1	25B		208
<u>}</u>		phthalate	dimethyl p	71B		25B	ND	1,3-dichlorobenzene	1	26B		21B
<u>></u>		hracene A	benzo(a)anthr	72B		5B	ND	1,4-dichlorobenzene	1	27B		22B
2	<u> </u>	o(a)pyrene	benzo (73B		6B	ND	3'dichlorobenzidine	3, 3	28B		23B
<u>}</u>		anthene *	benzo(b)fluoran	74B		7B	ND	2,4-dinitrotoluene		35B		. 27B
2	t.	anthene *	benzo(k)fluoran	75B		9B	ND	2,6-dinitrotoluene		36B		28B
<u>}</u>		hrysene A	chr	76B		18B	ND	2-diphenylhydrazine	1,2	37B		29B
<u>;</u>	<u> </u>	aphthylene	acenap	77B		2B	5	fluoranthene		398	<u>1366</u>	31B
<u>}</u>		hracene B	anthr	78B	1183	38	ND	henyl phenyl ether	4-chlorop	40B		. 17B
						•	•					

CURPURATION

PAGE 7 RECEIVED: 10/10/85 Analytical Serv

nitrobenzene ND :

Serv REPORT Results by Sample

LAB # 85-10-058 Continued From Above

NAME Method 625 Base/Neutrals SAMPLE ID Con-1 TEST CODE M625 B Date & Time Collected 10/03/85 Categoru 4-bromophenyl phenyl ether ____ND : 14B 79B benzo(ghi)perylene ____ND 42B bis(2-chloroisopropyl)ether ____ND : 12B 32B 1025 fluorene 3 **80B** 10B bis(2-chloroethoxy)methane ND : 44B 1175 81B phenanthrene B _____8 hexachlorobutadiene ____ND : dibenzo(a, h)anthracene ____ 34B 52B 19B 82B hexachlorocyclopentadiene ND : 53B 35B 37B 83B indeno(1,2,3-cd)pyrene _ 54B 38B isophorone ND ! 45B 84B pyrene No 55B 39B 673 naphthalene ____ 3 :

SURROGATE RECOVERIES

56B

40B

Т	CODE	SCAN
nitrobenzene <u>84</u>	BS1	566
uorobiphenyl <u>65</u>	BS2	838
14-terpheny1 <u>37</u>	BS3	1429
d10-biphenyl <u>na</u>	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

RECEIVED: 10/10/85

Analytical Serv

REPORT

Results by Sample

LAB # 85-10-058 Continued From Above

SAMPLE ID Con-1

FRACTION OIG

Date & Time Collected 10/03/85

TEST CODE M625 B NAME Method 625 Base/Neutrals

Category

B = anthracene and phenanthrene co-elute in high concentrations. BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 85-10-058

RECEIVED: 10/10/85

Results by Sample

SAMPLE ID <u>Con-1</u> FRACTION <u>O1E</u> TEST CODE <u>MS 624</u> NAME <u>EPA Method 624/GC-MS</u>

Date & Time Collected <u>10/03/85</u> Category

	J valegory	0010	LCVCU IVI	IIIC OOL	Dave o			
	MM VERIFIED 3400 COMPOUNDS DETEC	ALYST JMENT		16/85	DATE INJECTED		A FILE 4CU FACTOR	
RESULT	COMPOUND	EPA	DES SCAN	BULT N	COMPOUND	С	SCAN EPA	NPDES
NE	1,2-dichloropropane	32 v	170	ND :	benzene		4V	37
NB	cis-1,3-dichloropropylene	33V	18V	ND	carbon tetrachloride	car	6V	44
ND	trans-1,3-dichloropropylene	337	187	ND	chlorobenzene		7∨	70
ND	ethylbenzene	785	197	ND	1,2-dichloroethane	1	10V	157
10 E	methylene chloride	440	22V <u>106</u>	ND	,1,1-trichloroethane	1,1,	11V	27V
ND	methyl chloride	45V	21V	ND	1,1-dichloroethane	1	13V	140
ND	methyl bromide	46V	20V	ND	,1,2-trichloroethane	1, 1,	14V	_ 28V
NE	bromoform	47V	57	ND	,2-tetrachloroethane	1, 1, 2, 2-	15V	237
<u>ND</u>	dichlorobromomethane	48V	127	ND	chloroethane		16V	97
NE	trichlorofluoromethane	49V	307	ND	loroethylvinyl ether	2-chlor	19V	100
ND	chlorodibromomethane	51V	87	ND .	chloroform		23V	117
<u>ND</u>	tetrachloroethylene	85V	247	ND	1,1-dichloroethylene	1, 1	2 9 V	167
<u>14D</u>	toluene	86 V	25V	ND :	ans-dichloroethylene	1,2-trans	30V	26V
<u>t4D</u>	trichloroethylene	87V	29V			•		
<u> </u>	vinyl chloride	88V	31V					
							•	

RECEIVED: 10/10/85

Analytical Serv

LAB # 85-10-058

Results by Sample

Continued From Above

SAMPLE ID Con-1

FRACTION <u>01E</u>

TEST CODE MS 624 Date & Time Collected 10/03/85

NAME EPA Method 624/GC-MS

Cateooru

SURROGATE RECOVERIES

SULT	COMPOUND RE	CODE	SCAN
82	d4-1,2-dichloroethane	VS1	199
100	d8-toluene	VS2	385
56	bromofluorobenzene	VS3	473

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 85-10-058

Results by Sample

SAMPLE ID Con-2 FRACTION O2G TEST CODE M625 B NAME Method 625 Base/Neutrals

Date & Time Collected 10/07/85 Category

		חשום (X ITHE C	0116666	50 TOV	<u> </u>	· · · · · · · · · · · · · · · · · · ·	caredond		
	FACTOR				ANA NSTRÚ	LYST	32 WJL	VERIFI COMPOUNDS DET		
NPDES	SCAN EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	CO	MPOUND	RES	EULT
1 B	1 B	acenaphthene	<u>ND</u>	41B		61B	N-nitr	osodimethylami	ne <u> </u>	ND
4B	5B	benzidine	ND	43B		62B	N-nitr	osodiphenylami	ne	ND
46B	88	1,2,4-trichlorobenzene	ND	42B		63B	N-nitroso	di-n-propylami	ne	ND
33B	9B	hexachlorobenzene	<u>ND</u>	1 13B	<u>1615</u>	66B	bis(2-ethy	lhexyl)phthala	ite	<u> </u>
36B	12B	hexachloroethane	ND	15B		67B	buty1	benzyl phthala	ite	ND
11B	18B	bis(2-chloroethyl)ether	ND	26B	1279	88a	di	-butyl phthala	ite	14
16B	20B	2-chloronaphthalene	ND	29B		69B	di-n	-octyl phthala	ite —	ND
20B	25B	1,2-dichlorobenzene	ND	: 24B		70B	đ	iethyl phthala	te	ND
- 218	26B	1,3-dichlorobenzene	ND	25B		71B	di	methyl phthala	te	ND
22B	27B	1.4-dichlorobenzene	ND	5B		72B	benzo	(a)anthracene	Α	ND
23B	288	3,3'dichlorobenzidine	ND	. 6B		73B		benzo(a)pyre	ne	ND
27B	35B	2.4-dinitrotoluene	ND	7B		74B	benzo(b)fluoranthene	*	ND
28B	36B	2.6-dinitrotoluene	ND	: 9B		75B	benzo(k)fluoranthene	*	ND
29B	378	1.2-diphenylhydrazine	ND	188		76B		chrysene	Α	ND
- 31B	39B	fluoranthene	ND	: 2B		77B		acenaphthyle	ne	ND
17B	40B	4-chlorophenyl phenyl ether	ND	: 3B		78B		anthracene	В	ND
	100			1,,,						

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LAB # 85-10-058 Continued From Above

Results by Sample

SAMPLE ID	Con-2		RACTION ate & Ti			ODE <u>M625 B</u> 10/07/85	NAME <u>Method 625 Base/Neu</u> Category	itrals
14B .	418	4-bromophenyl phenyl e	ther	ND	88	79B	benzo(ghi)perylene	ND
12B	428	bis(2-chloroisopropyl)e	ther	ND	32B	808	fluorene	ND
1 OB	43B	bis(2-chloroethoxy)met	hane	ND	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobutad	iene	ND	19B	82B	dibenzo(a,h)anthracene	<u>N5</u>
35B	53B	hexachlorocyclopentad	iene	ND	378	83B	indeno(1,2,3-cd)pyrene	NE
388	54B	isopho	rone	ND	45B	84B	pyrene	ND
39B	55B	naphtha	lene	ND	i 1 1			
40B	56B	nitroben	zene	ND	i i			

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
107	d5-nitrobenzene_	BS1	<u>568</u>
81	2-fluorobiphenyl_	BS2	840
64	d14-terphenyl_	BS3	1432
Dа	d10-biohenul	B54	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in uq/l unless otherwise specified. ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84). * = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute. A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPO

Results by Sample

LAB # 85-10-058 Continued From Above

SAMPLE ID Con-2

FRACTION <u>O2G</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>10/07/85</u> Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

Analytical Serv

REPORT

LAB # 85-10-058

RECEIVED: 10/10/85

Results by Sample

SAMPLE ID Con-2 FRACTION O2E TEST CODE MS 624 NAME EPA Method 624/GC-MS

Date & Time Collected 10/07/85 Category

_			<u>v</u>	<u> </u>									
_		MM VERIFIED OO COMPOUNDS DETEC		ALYST IMENT	ANA INSTRU		10/16/85	DATE INJECTED	10058V02 1			DAT CONC.	ı
٢	RESUL	COMPOUND	i	EPA	SCAN	NPDES	RESULT I	COMPOUND	CO	EPA	SCAN	NPDES	1
3		1,2-dichloropropane	1	32V		17V	ND :	benzene		44		37	
2	<u>1</u>	s-1,3-dichloropropylene	c	33V		187	ND	bon tetrachloride	carb	67		67	
3		s-1,3-dichloropropylene	tra	33V		187	ND	chlorobenzene		7V		7٧	
<u>}</u>		ethylbenzene		38V		197	ND	.,2-dichloroethane	1.	107		157	
<u>}</u>	1.1	methylene chloride	,	44V	102	227	ND	1-trichloroethane	1, 1, 1	11V		27V	
2	t	methyl chloride		45V		21V	ND	1-dichloroethane	1,	13V		14V	
<u>}</u>		methyl bromide		46V	•	207	ND	2-trichloroethane	1,1,2	14V		287	
<u>;</u>		bromoform		47V		5V	ND	tetrachloroethane	1, 1, 2, 2-t	15V		237	
<u>></u> .	<u></u>	dichlorobromomethane		48V		12V	ND	chloroethane		16V		9 V	
<u> </u>	<u></u>	trichlorofluoromethane		49V		307	ND	oethylvinyl ether	2-chloro	19V		100	
<u>}</u>		chlorodibromomethane		51 V		87	ND	chloroform		53 A		11V	
<u>}</u>	<u> </u>	tetrachloroethylene		85V		247	ND	-dichloroethylene	1, 1-	29V		16V	
<u>}</u>	10	toluene		867		2 5V	<u>ND</u>	-dichloroethylene	1.2-trans-	30V		26V	
<u> </u>		trichloroethylene		87V		297							
<u>}</u>	14	vinyl chloride		88V		317							

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Analytical Serv

REPORT

LAB # 85-10-058

RECEIVED: 10/10/85

Results by Sample

Continued From Above

SAMPLE ID Con-2

FRACTION <u>02E</u>

TEST CODE MS 624

NAME EPA Method 624/GC-MS

Date & Time Collected 10/07/85

Category

SURROGATE RECOVERIES

RESULT	COMPOUND F	CODE	SCAN
86	d4-1,2-dichloroethane	VS1	198
100	d8-toluene_	V52	384
95	bromofluorobenzene	vs3	473

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ___uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

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REPORT

LAB # 85-10-058

Results by Sample

SAMPLE ID Con-3 FRACTION O3A TEST CODE M625 B NAME Method 625 Base/Neutrals

Date & Time Collected 09/27/85 Category

				,			41121144		4-113113		
	TA FILE FACTOR	<u> 2cu:</u>	10058C03	DATE EXTRACTED DATE INJECTED		_	ANALYST STRUMENT	32 WL	VERIF COMPOUNDS DE		BY LAK
NPDES	SCAN E	PA	COM	מאטס -	RESULT	NPDES S	CAN EPA	•	COMPOUND		RESULT
1 B		18		acenaphthene	ND	418	618	N-ni	rosodimethylad	nine	ND
4B		5B		benzidine	ND	43B	628	N-nit	rosodiphenyla	nine	ND
46B		8B	1, 2, 4-ti	richlorobenzene	ND ND	42B	63B	N-nitros	odi-n-propylan	nine	ND
33B		9B	hea	xachlorobenzene	<u>ND</u>	13B	66B	bis(2-eth	ylhexyl)phthal	late	ND
36B	1	2B	h e	exachloroethane	ND	15B	67B	buty]	benzyl phthal	late	ND
11B	1	88	bis(2-ch)	loroethy1)ether	ND	26B <u>1</u> 3	<u>277</u> 68B	d	i-butyl phthal	late	14
16B	2	OB	2-ch1	loronaphthalene	ND	29B	69B	di-	n-octyl phthal	late	ND
20B	2	5B	1,2-0	dichlorobenzene	ND	24B	70B		diethyl phthal	late	<u>ND</u>
21B	2	26B	1,3-0	dichlorobenzene	<u>ND</u>	25B	71B	đ	imethyl phthal	late	ND
22B	2	27B	1,4-0	dichlorobenzene	ND	5B	72B	benz	o(a)anthracene	. A	ND
23B	2	88	3,3'dic	chlorobenzidine	ND	6 B	73B		benzo(a)pyr	.ene	ND
27B	3	15B	2, 4-	-dinitrotoluene	ND .	. 7B	74B	benzo (b)fluoranthene	. *	ND
28B	3	6B	2,6-	-dinitrotoluene	ND	9 B	75B	benzo (k)fluoranthene	* *	ND
29B	3	7B	1,2-dip	phenylhydrazine	ND	18B	76B		chrysene	. A	ND
31B	3	9B		fluoranthene	ND	28	77B		acenaphthy]	ene	ND
17B	4	OB 4	-chloropheny	ıl phenyl ether	ND	Эв	78B		anthracene	B	ND
					•						

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Serv REPORT Results by Sample

LAB # 85-10-058 Continued From Above

SAMPLE ID	Con-3		FRACTI Date &			CODE <u>M625 B</u> 09/27/85	NAME <u>Method 625 Base/Neutrals</u> Category
14B	41B	4-bromophenyl phenyl	ether	ND	88	79B	benzo(ghi)perylene <u>ND</u>
12B	42B	bis(2-chloroisopropyl)	ether	ND	32B	BOB	fluorene <u>ND</u>
10B	43B	bis(2-chloroethoxy)me	thane	ND	44B	818	phenanthrene B <u>ND</u>
34B	52B	hexachlorobuta	diene	ND	19B	838	dibenzo(a,h)anthracene N
35B	53B	hexachlorocyclopenta	diene	ND	37B	83 B	indeno(1,2,3-cd)pyrene ND
388	54B	isoph	orone	ND	45B	84B	pyrene <u>ND</u>
39B	55B	naphth	alene	ND			
40B	56B	nitrohe	nzene	ND !			

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
82	d5-nitrobenzene_	BS1	568
74	2-fluorobiphenyl_	852	1066
53	d14-terpheny1_	853	1430
na	d10-biphenyl	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in uq/l unless otherwise specified. ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84). * = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute. A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPORT

Results by Sample

LAB # 85-10-058 Continued From Above

SAMPLE ID Con-3

FRACTION 03A

TEST CODE M625 B Date & Time Collected 09/27/85

NAME <u>Method 625 Base/Neutrals</u>

Category

B = anthracene and phenanthrene co-elute in high concentrations. BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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REPORT

LAB # 85-10-058

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NonReported Work

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

01F | DUP624 02F | DUP624

05 Reagent Blank 625

PAGE 1 REPORT LAB # 86-02-158 Analutical Serv RECEIVED: 02/25/86 03/20/86 12:06:58 REPORT Radian PREPARED Radian Analytical Services TO B1. 4 BY 8501 MoPac Blvd. Austin P.O. Box 9948 CERTIFIED BY Austin, Texas 78766 ATTEN Robert Wallace ATTEN PHONE (512) 454-4797 CONTACT GRIMSHAW CLIENT LINCOLN SAMPLES 5 COMPANY Lincoln Properties FACILITY _____ Duplicate of report of 03/16/86. WORK ID 100 Congress TAKEN 2/24/86 Footnotes and Comments TRANS Fed Ex 736743926 TYPE H20 # Indicates a value less than 5 times the detection limit. P. O. # 229-025-06-20 Potential error for such low values ranges between INV. # 7535____ 50 and 100%. @ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present. SAMPLE IDENTIFICATION Analytical Serv TEST CODES and NAMES used on this report 01 I-1 ABN H2D EX 625 Extraction only - 625 BN/A 01 I-1 ABN H20 VOA IFB VS VOA Screen by IFB method 02 B-1 ABN H20 M625 A Method 625 Acid Compounds 02 B-1 ABN VDA H20 M625 B Method 625 Base/Neutrals 03 E-1 ABN H20 MS 624 EPA Method 624/GC-MS 03 E-1 ABN VOA H20 04 E-2 ABN H20 04 E-2 VOA H20 05 Reagent Blank 624

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Analytical Serv REF RESULTS BY TEST

LAB # 86-02-158

TEST CODE	Sample <u>Ol</u>	Sample <u>02</u> (entered units)	Sample <u>03</u> (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
EX_625 date complete	02/26/86	02/26/86	02/26/86	02/26/86	02/26/86
IFB_VS date complete	02/25/86	02/25/86	02/25/86	02/25/86	

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Analytical Serv

REPORT

LAB # 86-02-158

Results by Sample

SAMPLE ID I-1 ABN H20

FRACTION <u>O1A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>
Date & Time Collected 02/24/86 Category

DATA FILE <u>5CU02158C01</u> CDNC. FACTOR 1 DATE EXTRACTED 02/26/86
DATE INJECTED 03/10/86

2-nitrophenol ND :

ANALYST WJL
INSTRUMENT 5100

VERIFIED BY LAK COMPOUNDS DETECTED - 1

NPDES SCAN EPA COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 2.4.6-trichlorophenol ND : 11A 21A **7A** 58A 4-nitrophenol ND 4-chloro-3-methylphenol ND : **8A** 22A 5A 59A 2,4-dinitrophenol ND 24A 2-chlorophenol ND : 60A 2-methyl-4,6-dinitrophenol ND 1A 4A 2A 31A 2.4-dichlorophenol ND : 9A 64A pentachlorophenol ND 3A 34A 2,4-dimethylphenol ND : phenol ____2 10A _392 65A

SURROGATE RECOVERIES

6A

57A

 SCAN CODE
 COMPOUND
 RESULT

 390
 AS1
 d5-phenol
 90

 286
 AS2
 2-fluorophenol
 88

 987
 AS3
 2,4,6-tribromophenol
 156

 AS4
 d3-phenol

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

limits should be multiplied by conc. factor.

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Analytical Serv

Serv REPOR Results by Sample

LAB # 86-02-158
Continued From Above

SAMPLE ID I-1 ABN H20

FRACTION <u>O1A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>

Date & Time Collected <u>02/24/86</u> Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Analytical Serv REPORESULTS by Sample

SAMPLE ID I	-1 ABN H20		ION <u>01A</u> & Time C		code 02/2		
DATA FIL	E <u>5CU021580</u>	DATE EXTRACTED DATE INJECTED		_	ANAL INSTRUM		WJL VERIFIED BY LAK 5100 COMPOUNDS DETECTED 2
NPDES SCAN	EPA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND RESULT
1 B	1 B	acenaphthene	ND	41B		61B	N-nitrosodimethylamine <u>ND</u>
4 B	5B	benzidine	ND	43B		62B	N-nitrosodiphenylamine <u>ND</u>
46B	8B 1	1,2,4-trichlorobenzene	ND	42B		63B	N-nitrosodi-n-propylamine <u>ND</u>
33B	9B	hexachlorobenzene	ND	13B	1520	66B	bis(2-ethylhexyl)phthalate3
36B	12B	hexachloroethane	ND	1 15B		67B	butyl benzyl phthalate <u>ND</u>
11B	18B b i	is(2-chloroethyl)ether	ND	: 26B	1194	888	di-butyl phthalate <u>3 BL</u>
16B	20B	2-chloronaphthalene	ND	1 1 29B		69B	di-n-octyl phthalate <u>NB</u>
20B	25B	1,2-dichlorobenzene	ND	: : 24B		70B	diethyl phthalate <u>ND</u>
218	26B	1.3-dichlorobenzene	ND	: : 25B		71B	dimethyl phthalate <u>ND</u>
22B .	27B	1,4-dichlorobenzene	ND	: : 5B		72B	benzo(a)anthracene A <u>ND</u>
23B	28B	3,3'dichlorobenzidine	ND	: 6B		73B	benzo(a)pyrene <u>ND</u>
27B	35B	2,4-dinitrotoluene	ND	; 7B		74B	benzo(b)fluoranthene * <u>ND</u>
288	36B	2,6-dinitrotoluene	ND	: 9B		75B	benzo(k)fluoranthene * <u>ND</u>
29B	37B	1,2-diphenylhydrazine	ND	1 1 188		76B	chrysene A <u>ND</u>
31B	39B	fluoranthene	ND	: 2B		77B	acenaphthylene <u>ND</u>
17B	40B 4-chlo	rophenyl phenyl ether	ND	: : 3B		78B	anthracene B <u>ND</u>

Analytical Serv

Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID	I-1 A	BN H20	FRACT Date				CODE <u>M625 B</u> 02/24/86	NAME <u>Method 625 Base/Neu</u> Category	<u>itrals</u>
14B	41B	4-bromophenyl phenyl	ether		ID :	88	79B	benzo(ghi)perylene	ND
12B	42B	bis(2-chloroisopropyl)ether	<u>N</u>	ID :	32B	808	fluorene	ND
1 OB	43B	bis(2-chloroethoxy)m	ethane	N	1D	44B	81B	phenanthrene B	ND
34B	52B	hexachlorobut	adiene	N	TD :	19B	82B	dibenzo(a,h)anthracene	ND
35B	53B	hexachlorocyclopent	adiene	N	ID :	37B	83B	indeno(1,2,3-cd)pyrene	ND
388	54B	isop	horone	N	1 <u>D</u>	45B	84B	, pyrene	ND
3 9 B	55B	napht	halene	N	<u>a</u>				
40B	56B	nitrob	enzene	N	<u>1D</u> :				

SURROGATE RECOVERIES

RESULT	CODE	SCAN
d5-nitrobenzene <u>102</u>	BS1	504
2-fluorobiphenyl <u>112</u>	BS2	776
d14-terphenyl <u>56</u>	BS3	1342
d10-biphenyl	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in uq/l unless otherwise specified. ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84). * = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute. A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

Serv REPORT Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID I-1 ABN H20

FRACTION <u>O1A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>
Date & Time Collected <u>O2/24/86</u> Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

LAB # 86-02-158

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Analytical Serv REPORESULTS by Sample

***************************************	D. DEFERRE		11636143 6	a mamber	•	•	
SAMPLE	ID <u>I-1 ABN F</u>		CTION <u>01B</u> e & Time Co	TEST CODE ollected <u>02/</u>		NAME <u>EPA Method 624/</u> Category	
	FILE 4CUO21		ED <u>03/04/8</u>	<u>6</u> ANA INSTRU	LYST	REM VERIF F4 COMPOUNDS DE	TECTED 1
NPDES S	CAN EPA	COMPOUND	RESULT	NPDES SCAN	EPA	COMPOUND	RESULT
VE	4٧	benze	ne <u>ND</u>	17V	32 V	1,2-dichloroprop	ane <u>ND</u>
67	67	carbon tetrachlori	de <u>ND</u>	18V	33V ci	s-1,3-dichloropropyl	ene <u>NE</u>
7٧	7V	chlorobenze	ne <u>ND</u>	: 18V	33V trans	s-1,3-dichloropropyl	ene <u>ND</u>
15V	100	1,2-dichloroetha	ne <u>ND</u>	19V	38V	ethylbenz	ene <u>ND</u>
277	. 114	1,1,1-trichloroetha	ne <u>ND</u>	22V <u>103</u>	44V	methylene chlor	ide <u>1 J</u>
14V	13V	1,1-dichloroetha	ne <u>ND</u>	! ! 21V	45V	methyl chlor	ide <u>ND</u>

7٧	7V	chlorobenzene	ND	187	33V	trans-1.3-dichloropropylene	ND
15V	100	1,2-dichloroethane	ND	19V	VSE	ethylbenzene	MD
27V	. 11V	1,1,1-trichloroethane	<u>ND</u>	22V <u>103</u>	44V	methylene chloride	<u>1</u> J
14V	13V	1,1-dichloroethane	ND	21V	45V	methyl chloride	ND
28V	14V	1,1,2-trichloroethane	ND	20V	46V	methyl bromide	ND
23V	15V	1, 1, 2, 2-tetrachloroethane	ND	5V	47V	bromoform	ND
9 V	16V	chloroethane	ND	12V	48V	dichlorobromomethane	NE
10V	. 19V	2-chloroethylvinyl ether	ND	300	49V	trichlorofluoromethane	ND
11V	23V	chloroform	<u>ND</u>	87	51V	chlorodibromomethane	ND
16V	2 9 V	1,1-dichloroethylene	<u>ND</u>	24V	85V	tetrachloroethylene	NE
26V	300	1,2-trans-dichloroethylene	<u>ND</u>	25V	867	toluene	ND
				29V	87V	trichloroethylene	ND
				317	887	vinyl chloride	ND

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID I-1 ABN H20 VOA

FRACTION 01B

TEST CODE MS 624 Date & Time Collected 02/24/86

NAME EPA Method 624/GC-MS

Categoru

SURROGATE RECOVERIES

ESULT	COMPOUND	CODE	SCAN
105	d4-1,2-dichloroethane	VS1	199
98	d8-toluene	VS2	377
101	bromofluorobenzene	VS3	466

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID B-1 ABN H20

FRACTION <u>O2A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>
Date & Time Collected <u>O2/24/86</u> Category

DATA FILE <u>5CU02158C12</u>
CONC. FACTOR ____1

DATE EXTRACTED 02/26/86
DATE INJECTED 03/10/86

2-nitrophenol ND :

ANALYST WJL
INSTRUMENT 5100

VERIFIED BY LAK COMPOUNDS DETECTED 1

NPDES SCAN EPA COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 11A 21A 2.4.6-trichlorophenol ND : 58A 4-nitrophenol ____ND 22A 4-chloro-3-methylphenol ND | BA 59A 2,4-dinitrophenol ND 1A 24A 2-chlorophenol ND : 60A 2-methyl-4, 6-dinitrophenol ND 2,4-dichlorophenol ____ND i 31A 2A 64A pentachlorophenol <u>ND</u> 2.4-dimethylphenol ____ND { 34A 3A 10A 391 65A phenoi 1

SURROGATE RECOVERIES

6A

57A

 SCAN CODE
 COMPOUND
 RESULT

 370
 AS1
 d5-phenol
 87

 285
 AS2
 2-fluorophenol
 89

 987
 AS3
 2, 4, 6-tribromophenol
 160

 AS4
 d3-phenol

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.

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Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID B-1 ABN H20

FRACTION <u>O2A</u> TEST CODE <u>M625 A</u> N Date & Time Collected O2/24/86

NAME <u>Method 625 Acid Compounds</u>

Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CDNC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-158

Results by Sample

SAMPLE ID B-1 ABN H2D NAME Nethod 625 Base/Neutrals TEST CODE M625 B Date & Time Collected 02/24/86 Categoru DATA FILE 5CU02158C12 DATE EXTRACTED 02/26/86 ANALYST WJL VERIFIED BY LAK CONC. FACTOR DATE INJECTED 03/10/86 INSTRUMENT 5100 COMPOUNDS DETECTED NPDES SCAN COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 1 B 1 B acenaphthene ND 1 41B 61B N-nitrosodimethylamine ND **4B** 5B benzidine ND : 43B 62B N-nitrosodiphenylamine ND 46B 88 1,2,4-trichlorobenzene 42B N-nitrosodi-n-propylamine <u>ND</u> **63B 33B** hexachlorobenzene ND ; 13B 1520 66B bis(2-ethylhexyl)phthalate ____1 36B 12B hexachloroethane <u>ND</u> ; 15B 67B butul benzul phthalate ND bis(2-chloroethyl)ether ____ND { 18B 11B 26B 1194 68B di-butyl phthalate 2 BL 16B **20B** 2-chloronaphthalene ND : 29B 69B di-n-octyl phthalate ND 1.2-dichlorobenzene ____ND : 20B 25B 24B **70B** diethul phthalate ND 26B 21B 1,3-dichlorobenzene ND : 25B 71B dimethyl phthalate ND **22B** 27B 1,4-dichlorobenzene ND : 72B benzo(a)anthracene A ND 23B 28B 3.3'dichlorobenzidine ____ND : 73B benzo(a)pyrene ____ ND 27B 35B 2.4-dinitrotoluene <u>ND</u>: **7B** 74B benzo(b)fluoranthene * ND 36B 2.6-dinitrotoluene ND : **9B** benzo(k)fluoranthene * ____ND 28B 75B 37B 29B 1.2-diphenylhydrazine ND : 18B 76B chrysene A ND 39B 31B fluoranthene ____ ND: 28 77B acenaphthylene ____ ND 40B 4-chlorophenyl phenyl ether __ 17B **3B** 78B anthracene

Analytical Serv REPORT PAGE 13 LAB # 86-02-158 RECEIVED: 02/25/86 Results by Sample Continued From Above NAME Method 625 Base/Neutrals SAMPLE ID B-1 ABN H20 FRACTION 02A TEST CODE M625 B Date & Time Collected 02/24/86 Categoru 41B 4-bromophenyl phenyl ether ND : 14B 79B benzo(ghi)perylene ND 42B bis(2-chloroisopropyl)ether ND : 12B 32B 80B fluorene ND 10B bis(2-chloroethoxy)methane 44B 81B phenanthrene B ND 52B 34B hexachlorobutadiene <u>ND</u> 1 dibenzo(a, h)anthracene ND 19B 82B 35B 53B hexachlorocyclopentadiene ____ 37B **83B** indeno(1,2,3-cd)pyrene ND 54B 38**B** 45B 84B isophorone ____ purene ND

naphthalene ____

nitrobenzene

SURROGATE RECOVERIES

55B

56B

39B

40B

	RESULT	CODE	SCAN
82	d5-nitrobenzene_	BS1	504
92	2-fluorobiphenyl_	BS2	766
48	d14-terphenyl_	BŚ3	1342
	d10-biohenul	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in <u>uq/l</u> unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

Continued From Above

SAMPLE ID B-1 ABN H20

FRACTION 02A

TEST CODE M625 B

NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected 02/24/86

Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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LAB # 86-02-158

Analytical Serv REPORESULTS by Sample

SAMPLE ID B-1 ABN VOA H20	FRACTION 02B	TEST CODE MS 624	NAME EPA Method 624/GC-MS
	Date & Time Coll	ected 02/24/86	Category

	TA FILE FACTOR	<u>4CU</u>	DATE INJECTED	03/04/8	_	ANALYST INSTRUMENT	REM F4 C	VERIFIE OMPOUNDS DETE	D BY LAK CTED <u>O</u>
NPDES	SCAN E	PA	COMPOUND	RESULT	NPDES	SCAN EPA	COMP	DUND	RESULT
ЗV		4 V	benzene	ND	170	32V	1,2-d	ichloropropan	e <u>ND</u>
6V		6V	carbon tetrachloride	ND	18V	33V	cis-1,3-dic	hloropropylen	e <u>ND</u>
7٧		7 V	chloropenzene	<u>ND</u>	18V	33V	trans-1,3-dic	hloropropylen	e <u>ND</u>
157	1	OV	1,2-dichloroethane	ND	190	387		ethylbenzen	e <u>ND</u>
27V	1	1٧	1,1,1-trichloroethane	ND	227	44V	meth	ylene chlorid	e <u>ND</u>
14V	1	37	1.1-dichloroethane	ND	217	45V	m	ethyl chloride	e <u>ND</u>
287	1	4V	1,1,2-trichloroethane	ND	207	46V		methyl bromide	a <u>ND</u>
237	1	5V	1, 1, 2, 2-tetrachloroethane	ND	57	47V		bromofor	n <u>140</u>
9V	1	6V	chloroethane	ND	127	48V	dichlo	robromomethane	a <u>ND</u>
- 10V	1	9 V	2-chloroethylvinyl ether	ND	VOE	49V	trichlor	ofluoromethane	a <u>ND</u>
117	2	VE	chloroform	ND	87	51V	chloro	dibromomethane	a <u>ND</u>
167	2	.9V	1.1-dichloroethylene	<u>ND</u>	247	85V	tetra	chloroethylene	a <u>ND</u>
5 67	3	OV	1.2-trans-dichloroethylene	<u>ND</u>	257	867		. toluene	ND ND
					297	87V	tri	chloroethylene	∍ <u>ND</u>
-					31V	88 v		vinyl chloride	ND ND
			•						





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LAB # 86-02-158

Results by Sample

Continued From Above

SAMPLE ID B-1 ABN VOA H20

TEST CODE MS 624 FRACTION 02B Date & Time Collected 02/24/86

NAME EPA Method 624/GC-MS

Category

SURROGATE RECOVERIES

RESULT	COMPOUND	CODE	SCAN
108	d4-1,2-dichloroethane	VS1	200
98	d8-toluene	VS2	377
99	bromofluorobenzene	VS3	465

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in uq/1 unless otherwise specified.

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BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

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Analytical Serv

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID E-1 ABN H20

FRACTION <u>O3A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u> Date & Time Collected 02/24/86 Category

DATA FILE 5CU02158C03 CONC. FACTOR _____1

DATE EXTRACTED 02/26/86 DATE INJECTED 03/10/86

ANALYST

VERIFIED BY LAK

INSTRUMENT COMPOUNDS DETECTED 0

NPDES S	SCAN EF	PA	COMPOUND	RESULT	NPDES	SCAN	EPA	COMPOUND	RESULT
11A	21	l A	2,4,6-trichlorophenol	ND	1 7A		58A	4-nitrophenol	ND
BA	22	2A	4-chloro-3-methylphenol	ND	1 1 5A		59A	2,4-dinitrophenol	ND
1A	24	ŧΑ	2-chlorophenol	ND	1 1 4A		60A	2-methyl-4,6-dinitrophenol	ND
2A	31	lA.	2,4-dichlorophenol		1		64A	pentachlorophenol	
ЗА	34	łΑ	2,4-dimethylphenol		1 .		65A	phenol	ND
6A	57	7A	2-nitrophenol	ND	1			·	

SURROGATE RECOVERIES

RESULT	COMPOUND	CODE	SCAN
henol <u>82</u>	·	AS1	389
henol <u>86</u>	2-f1	AS2	284
heno1 <u>124</u>	2,4,6-trib	AS3	<u>987</u>
henol		AS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in

ug/l unless otherwise specified.

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REPORT

LAB # 86-02-158

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Results by Sample

Continued From Above

SAMPLE ID E-1 ABN H20

FRACTION <u>O3A</u> TEST CODE <u>M625 A</u>
Date & Time Collected <u>O2/24/86</u>

NAME <u>Method 625 Acid Compounds</u>

Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

REPORT

LAB # 86-02-158

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Analytical Serv REPORESULTS by Sample

SAMPLE ID E-1 ABN H20	FRACTION <u>03A</u>	TEST CODE M625 B	NAME Method 625 Base/Neutrals
	Date & Time Coll	ected 02/24/86	Category

NPDES SCAN EPA COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 1B 1B accenaphthene ND 41B 61B N-nitrosodimethylamine ND 4B 5B benzidine ND 42B 62B N-nitrosodi-n-propylamine ND 46B 8B 1,2,4-trichlorobenzene ND 13B 1522 66B N-nitrosodi-n-propylamine ND 33B 9B hexachlorobenzene ND 13B 1522 66B bis(2-ethylhexyl)phthalate 2 36B 12B hexachlorobenzene ND 15B 67B butyl benzyl phthalate ND 11B 18B bis(2-chlorobethyl)ether ND 26B 1195 68B di-butyl phthalate ND 11B 18B bis(2-chlorobenzene ND 27B 69B di-n-octyl phthalate ND 16B 20B 2-chlorobenzene ND 24B 70B dimethyl phthalate ND		FACTOR _	CU02158C03	DATE EXTRACTED DATE INJECTED		-	ANA INSTRU	LYST MENT	WJL 5100	VER I COMPOUNDS D		BY TAK
4B 5B benzidine ND 43B 62B N-nitrosodiphenylamine ND 46B 8B 1, 2, 4-trichlorobenzene ND 42B 63B N-nitrosodi-n-propylamine ND 33B 9B hexachlorobenzene ND 13B 1522 66B bis(2-ethylhexyl)phthalate 2 36B 12B hexachloroethane ND 15B 67B butyl benzyl phthalate ND 11B 18B bis(2-chloroethyl)ether ND 26B 1195 68B di-butyl phthalate ND 16B 20B 2-chloronaphthalene ND 29B 67B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene ND 23B 28	NPDES	SCAN EP	Α (COMPOUND	RESULT	NPDES	SCAN	EPA		COMPOUND		RESULT
46B BB 1, 2, 4-trichlorobenzene ND 42B 63B N-nitrosodi-n-propylamine ND 33B 9B hexachlorobenzene ND 13B 1522 66B bis(2-ethylhexyl)phthalate 2 36B 12B hexachlorobethane ND 15B 67B butyl benzyl phthalate ND 11B 18B bis(2-chlorobethyl)ether ND 26B 1195 68B di-butyl phthalate ND 16B 20B 2-chloronaphthalene ND 26B 1195 68B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 25B 71B dimethyl phthalate ND 23B 28B 3,3'dichlorobenzidine ND 5B 72B benzo(a)anthracene A ND	1 B	1	B	acenaphthene	ND	41B		61B	N-ni	trosodimethyla	mine	ND
33B 98 hexachlorobenzene ND 13B 1522 66B bis(2-ethylhexyl)phthalate 2 36B 12B hexachloroethane ND 15B 67B butyl benzyl phthalate ND 11B 18B bis(2-chloroethyl)ether ND 26B 1195 68B di-butyl phthalate ND 16B 20B 2-chloronaphthalene ND 27B 69B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene * ND 28B 36B 2,6-dinitrotoluene ND 7B 75B benzo(k)fluoranthene * ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	4B	5	В	benzidine	ND	43B		62B	N-ni	.trosodiphenyla	mine	ND
36B 12B hexachloroethane ND 15B 67B butyl benzyl phthalate ND 11B 18B bis(2-chloroethyl)ether ND 26B 1195 68B di-butyl phthalate 2BL 16B 20B 2-chloronaphthalene ND 29B 69B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 7B 75B benzo(k)fluoranthene ND 29B 37B	46B	8	B 1,2,4	-trichlorobenzene	ND	42B		63B	N-nitro	sodi-n-propyla	mine	ND
11B bis(2-chloroethyl)ether ND 26B 1195 68B di-butyl phthalate 2BL 16B 20B 2-chloronaphthalene ND 27B 69B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A 31B 39B fluoranthene ND	33B	9	B .	hexachlorobenzene	ND	13B	1522	66 <u>B</u>	bis(2-et	hylhexyl)phtha	late	2
16B 20B 2-chloronaphthalene ND 27B 69B di-n-octyl phthalate ND 20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	36B	. 12	В	hexachloroethane	ND	15B		67B	buty	l benzyl phtha	late	ND
20B 25B 1,2-dichlorobenzene ND 24B 70B diethyl phthalate ND 21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	11B	18	B bis(2-	chloroethyl)ether	ND	26B	<u>1195</u>	68B		di-butyl phtha	late	2 BL
21B 26B 1,3-dichlorobenzene ND 25B 71B dimethyl phthalate ND 22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	16B	20	B 2-	chloronaphthalene	ND ND	29B		69B	d i	-n-octyl phtha	late	<u> ND</u>
22B 27B 1,4-dichlorobenzene ND 5B 72B benzo(a)anthracene A ND 23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	20B	25	В 1,	2-dichlorobenzene	ND	24B		70B		diethyl phtha	late	MD
23B 28B 3,3'dichlorobenzidine ND 6B 73B benzo(a)pyrene ND 27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene * ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene * ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	21B	26	B 1,	3-dichlorobenzene	ND	25B		71B		dimethyl phtha	late	NB
27B 35B 2,4-dinitrotoluene ND 7B 74B benzo(b)fluoranthene * ND 28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene * ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	22B	27	B 1,	4-dichlorobenzene	ND	5B		72B	ben	zo(a)anthracen	e A	ND
28B 36B 2,6-dinitrotoluene ND 9B 75B benzo(k)fluoranthene ND 29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	23B	28	B 3,3'	dichlorobenzidine	ND	6B		73B		benzo(a)py	rene	ND
29B 37B 1,2-diphenylhydrazine ND 18B 76B chrysene A ND 31B 39B fluoranthene ND 2B 77B acenaphthylene ND	27B	35	В 2	2,4-dinitrotoluene	ND	7B		74B	benzo	(b)fluoranthen	е #	ND
31B 39B fluoranthene ND 2B 77B acenaphthylene ND	28B	36	B 2	2.6-dinitrotoluene	ND	9 B		75B	benzo	(k)fluoranthen	e *	ND
	29B	37	B 1,2-	diphenylhydrazine	ND	18B		76B		chrysen	e A	ND
17P 40P 4-chlorophanul phanul atthen ND ! 3P 78P	31B	39	В	fluoranthene	ND	2B		77B		acenaphthy	lene	<u>N</u>
17B 40B 4-Cultotobuends buends exist 18D 1 3B 70B authracene B ND	17B	40	B 4-chloroph	enyl phenyl ether	ND	ЗВ		78B		anthracen	e B	ND

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LAB # 86-02-158

Results by Sample

Continued From Above

SAMPLE II	E-1 A	BN H20	FRACT Date			CODE M625 B 1 02/24/86	NAME <u>Method 625 Base/Neutrals</u> Category
14B	41B	4-bromophenyl phenyl	ether	ND	: 8B	79B	benzo(ghi)perylene <u>ND</u>
12B	42B	bis(2-chloroisopropyl)ether	ND	328	BOB	fluorene <u>ND</u>
1 OB	43B	bis(2-chloroethoxy)m	ethane	ND	44B	818	phenanthrene B <u>ND</u>
34B	52B	hexachlorobut	adiene	ND	19B	82B	dibenzo(a,h)anthracene ND
35B	53B	hexachlorocyclopent	adiene	ND	37B	83B	indeno(1,2,3-cd)pyrene <u>ND</u>
388	54B	isop	horone	ND	45B	84B	pyrene <u>ND</u>
39B	55B	napht	halene	ND	•		
40B	56B	nitrob	enzene	ND	1		

SURROGATE RECOVERIES

RESULT	CODE	SCAN
d5-nitrobenzene <u>70</u>	BS1	504
2-fluorobiphenyl <u>80</u>	BS2	<u>766</u>
d14-terphenyl <u>38</u>	853	1343
d10-biohenul	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID E-1 ABN H20

FRACTION <u>O3A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>O2/24/86</u> Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

Analytical Serv

LAB # 86-02-158

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Results by Sample

		•		a combi	E30163 B	· ·		. VEIEUI	WEALTA
	-MS		CODE <u>MS 8</u> 02/24/88		ION <u>O3B</u> & Time C		BN VOA H20	ID <u>E-1</u> AI	SAMPLE
		REM VERIFIED F4 COMPOUNDS DETEC	ANALYST STRUMENT		03/04/8	DATE INJECTED	U02158V03	FILE 4CL	
_T	RESUL	COMPOUND	CAN EPA	NPDES	RESULT	COMPOUND	COMP	AN EPA	NPDES
নচ	e <u>· </u>	1,2-dichloropropane	32 V	170	ND	benzene	·	40	34
AID	e <u>t</u>	cis-1,3-dichloropropylene	33 V	18V	ND	arbon tetrachloride	carbon	6V	67
4D	<u> </u>	trans-1,3-dichloropropylene	33V	18V	ND	chlorobenzene		7 V	7 V
<u>1D</u>	e <u> </u>	ethylbenzene	387	1 190	ND	1.2-dichloroethane	1.2-	10V	15V
<u>1D</u>	<u> </u>	methylene chloride	44V	220	ND	1,1-trichloroethane	1, 1, 1-t	11V	27V
4D	<u> </u>	methyl chloride	45V	210	ND	1,1-dichloroethane	1, 1-	13V	14V
<u>4D</u>	<u>1</u> =	methyl bromide	46V	200	<u>ND</u>	1,2-trichloroethane	1, 1, 2-t	14V	287
<u>VD</u>	n <u>t</u>	nroform	47V	50	ND	2-tetrachloroethane	1, 1, 2, 2-tet	15V	23V
<u>10</u>	<u> </u>	dichlorobromomethane	48V	120	<u>ND</u>	chloroethane		16V	97
AD O	<u> </u>	trichlorofluoromethane	49V	307	ND	oroethylvinyl ether	2-chloroet	190	10V
4D	<u> </u>	chlorodibromomethane	51V	1 1 8V	<u>ND</u>	chloroform		237	11V
<u>1D</u>	<u> </u>	tetrachloroethylene	857	1 24V	ND	.1-dichloroethylene	1.1-di	297	167
1 <u>D</u>	•	toluene	86V	i I 25V	ND	ns-dichloroethylene	1.2-trans-di	30V	267
<u>1D</u>	·	trichloroethylene	87 V	297		,			
<u>1D</u>	<u> </u>	vinyl chloride	88V	317					

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-158

Continued From Above

SAMPLE ID E-1 ABN VOA H20

FRACTION 03B

TEST CODE MS 624 Date & Time Collected 02/24/86

NAME EPA Method 624/GC-MS

Category

SURROGATE RECOVERIES

SCAN CODE COMPOUND RESULT 200 VS1 d4-1,2-dichloroethane 103 377 **VS2** d8-toluene 101 bromofluorobenzene 99 **VS3** 466

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ____uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID E-2 ABN H20

FRACTION <u>O4A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>

Date & Time Collected <u>O2/24/86</u> Category

DATA FILE <u>5CU0215BC04</u>
CONC. FACTOR 1

DATE EXTRACTED 02/26/86
DATE INJECTED 03/10/86

2-nitrophenol ___ ND :

ANALYST WJL

VERIFIED BY LAK COMPOUNDS DETECTED 1

sito. Titoron

ECIED 03/10/86

INSTRUMENT 5100

NPDES SCAN	EPA	COMPOUND	RESULT	NPDES SCAN	EPA	COMPOUND R	RESULT
11A	21A	2.4.6-trichlorophenol	ND	! 7A	58A	4-nitrophenol _	ND
88	22A	4-chloro-3-methylphenol	<u>ND</u>	5A	59A	2.4-dinitrophenol _	ND
1A	24A	2-chlorophenol	ND	4A	60A	2-methyl-4,6-dinitrophenol _	ДИ
2A	31A	2,4-dichlorophenol	ND	9A	64A	pentachlorophenol _	ND
ЗА	34A	2.4-dimethylphenol	ND	10A <u>392</u>	65A	phenol _	5

SURROGATE RECOVERIES

6A

57A

 SCAN CODE
 COMPOUND
 RESULT

 390
 AS1
 d5-phenol
 79

 287
 AS2
 2-fluorophenol
 82

 987
 AS3
 2, 4, 6-tribromophenol
 116

 AS4
 d3-phenol

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.

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Analytical Serv

REPORT

LAB # 86-02-158 Continued From Above

RECEIVED: 02/25/86

SAMPLE ID E-2 ABN H20

Results by Sample

FRACTION <u>O4A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>

Date & Time Collected <u>O2/24/86</u> Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

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J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-158

Results by Sample

SAMPLE ID <u>E-2 ABN H20</u> FRACTION <u>O4A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>O2/24/86</u> Category

				or time or	1166060	VE/ET/OU		ceregory	
00	DATA FI		U02158C04 DATE EXTRACTED DATE INJECTED			ANALYST .	WJL 5100	VERIFI COMPOUNDS DET	ECTED S
NPI	ES SCAN	EPA	COMPOUND	RESULT	NPDES SC	AN EPA	100	1POUND	RESULT
	1B	1 B	acenaphthene	ND :	41B	61B	N-nitro	osodimethylami	ne <u>ND</u>
	4B	5B	benzidine	ND	43B	62B	N-nitro	osodiphenylami	ne <u>NE</u>
4	6B	88	1,2,4-trichlorobenzene	<u>ND</u>	4 2B	63B	N-nitrosod	li-n-propylami	ne <u>ND</u>
3	ЗВ	9B	hexachlorobenzene	ND	13B <u>15</u>	<u>21</u> 66B	bis(2-ethyl	lhexyl)phthala	te <u>1</u>
3	6B	12B	hexachloroethane	ND	15B	67B	butyl t	enzyl phthala	ite <u>ND</u>
1	1 B	188	bis(2-chloroethyl)ether	ND	26B <u>11</u>	94 68B	di-	-butyl phthala	te 2 BL
1	6B	20B	2-chloronaphthalene	ND	29B	69B	di-n-	octyl phthala	te <u>ND</u>
2	ОВ	25B	1,2-dichlorobenzene	ND	24B	70B	d i	ethyl phthala	te <u>ND</u>
2	1 B	26B	1,3-dichlorobenzene	ND	25B	71B	din	nethyl phthala	te <u>ND</u>
2	2B	27B	1,4-dichlorobenzene	ND	5B	72B	benzo(a)anthracene	A NE
2	3B	288	3,3'dichlorobenzidine	ND	6B	73 B		benzo(a)pyre	ne <u>ND</u>
2	7B	35B	2,4-dinitrotoluene	ND	7B	74B	benzo(b)	fluoranthene	* <u>ND</u>
2	88	36B	2,6-dinitrotoluene	ND	9B	75B	benzo(k)	fluoranthene	* <u>ND</u>
. 2	9B	37B	1,2-diphenylhydrazine	ND	18B	76B		chrysene	A ND
Э	1 B	39B	fluoranthene	ND	2B	77B		acenaphthyle	ne <u>ND</u>
1	7B	40B	4-chlorophenyl phenyl ether	ND	38	78B		anthracene	B ND
	والأسمر	.		1.0%	32.			•	

Analytical Serv REPORT LAB # 86-02-158 RECEIVED: 02/25/86 Results bu Sample Continued From Above SAMPLE ID E-2 ABN H20 NAME Method 625 Base/Neutrals TEST CODE M625 B FRACTION 04A Date & Time Collected 02/24/86 Categoru 14B 4-bromophenyl phenyl ether ____ND : 79B benzo(ghi)perylene ND 12B 42B bis(2-chloroisopropyl)ether ND : 32B BOB fluorene ND 10B bis(2-chloroethoxy)methane 81B 44B phenanthrene B 34B 52B hexachlorobutadiene 19B 82B dibenzo(a,h)anthracene hexachlorocyclopentadiene 35B 53B 83B 37B indeno(1,2,3-cd)pyrene isophorone ___ 38B 54B 45B 84B ourene _ 39B 55B naphthalene 56B 40B nitrobenzene ND :

ND

SURROGATE RECOVERIES

SCAN CODE

	KESOL I	COPE	SCHIL
96	d5-nitrobenzene_	BS1	<u>504</u>
112	2-fluorobiphenyl_	B\$2	766
46	d14-terpheny1_	BS3	1342
	d10-hinhenul	RS4	

RESULT

NOTES AND DEFINITIONS FOR THIS REPORT.

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID E-2 ABN H20

FRACTION 04A

TEST CODE M625 B

NAME Method 625 Base/Neutrals

Date & Time Collected 02/24/86 Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID <u>E-2 VOA H20</u> FRACTION <u>O4B</u> TEST CODE <u>MS 624</u> NAME <u>EPA Method 624/GC-MS</u>

Date & Time Collected <u>02/24/86</u> Category

			v isting Ar	714664	ER 0515 11 01			
	FACTOR		03/04/8	_	ANALYST INSTRUMENT	REM F4 C	VERIFIED OMPOUNDS DETEC	
NPDES	SCAN EPA	COMPOUND	RESULT	NPDES	SCAN EPA	COMP	DUND	RESULT
37	4٧	benzene	<u>ND</u>	170	32V	1,2-6	ichloropropane	ND
67	64	carbon tetrachloride	ND	187	33V	cis-1,3-dic	hloropropylene	ND
7V	7V	chlorobenzene	ND	18V	33V	trans-1,3-dic	hloropropylene	ND
15V	10V	1,2-dichloroethane	ND	190	38V		ethylbenzene	ND
270	11V	1,1,1-trichloroethane	ND	227	44V	meth	ylene chloride	ND
14V	13V	1.1-dichloroethane	ND	217	45V	តា	ethyl chloride	ND
287	14V	1,1,2-trichloroethane	ND	207	46V		methyl bromide	ND
237	15V	1,1,2,2-tetrachloroethane	ND	5 V	47V		bromoform	<u> NE</u>
97	16V	chloroethane	ND	127	48V	dichlo	robromomethane	110
100	`1 9 V	2-chloroethylvinyl ether	ND	307	49V	trichlor	ofluoromethane	MD
11V	23V	chloroform	ND	87	51 V	chloro	dibromomethane	ND
16V	29V	1,1-dichloroethylene	ND	24V	85V	tetra	chloroethylene	NB
267	30V	1,2-trans-dichloroethylene	ND	25V	867		toluene	ND
				297	87V	tri	chloroethylene	ND
				317	88V		vinyl chloride	ND

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Analytical Serv

REPORT

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID <u>Reagent Blank 624</u> FRACTION <u>05B</u> TEST CODE <u>MS 624</u> NAME <u>EPA Method 624/GC-MS</u>

Date & Time Collected <u>not specified</u> Category

	Titen	v she	110)	x 12111C QC				
	MM VERIFIED F4 COMPOUNDS DETEC	ALYST JMENT	AN/ INSTRU	_	03/04/86	VOOO DATE INJECTED 1	TOR	DATA F	ſ
RESULT	COMPOUND	EPA	SCAN	NPDES	RESULT	COMPOUND	AN EPA	NPDES SCA	1
ND	1,2-dichloropropane	32 v		170	ND	benzene	40	37	
ND	cis-1,3-dichloropropylene	33V		187	ND	carbon tetrachloride	64	67	
ND	trans-1,3-dichloropropylene	337		187	ND	chlorobenzene	7 V	70	
ND	ethylbenzene	387		190	ND	1,2-dichloroethane	10V	150	
ND	methylene chloride	44V		227	ND	1,1,1-trichloroethane	11 V	27V	
ND	methyl chloride	45V		217	ND	1,1-dichloroethane	13V	14V	
ND	methyl bromide	46V		20V	ND	1,1,2-trichloroethane	14V	28V	
ND	bromoform	47V		57	ND	1,2,2-tetrachloroethane	15V	237	
ND	dichlorobromomethane	48V		127	ND	chloroethane	16V	97	
NE	trichlorofluoromethane	49V		307	ND :	-chloroethylvinyl ether	197	10V	
ND	chlorodibromomethane	51V		87	ND	chloroform	237	11V	
ND	tetrachloroethylene	85V		247	ND	1,1-dichloroethylene	` 29V	16V	
ND	toluene	84V		25V	ND	-trans-dichloroethylene	30V 1	567	
ND	trichloroethylene	87V		257					
ND	vinyl chloride	887		31V			,		
	•								

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Analytical Serv

LAB # 86-02-158 Results by Sample

Continued From Above

SAMPLE ID Reagent Blank 624

FRACTION OSB TEST CODE MS 624 NAME EPA Method 624/GC-MS

Date & Time Collected not specified

Category

SURROGATE RECOVERIES

RESULT	COMPOUND	CODE	SCAN
thane <u>101</u>	d4-1,2-dichloroet	VS1	500
luene <u>95</u>	d8-to1	VS2	377
nzene <u>102</u>	bromofluorober	VS3	466

NOTES AND DEFINITIONS FOR THIS REPORT.

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All results reported in uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 624, (Federal Register, 10/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection

limits should be multiplied by conc. factor.

Analytical Serv

LAB # 86-02-158

RECEIVED: 02/25/86

Results by Sample

SAMPLE ID Reagent Blank 625

TEST CODE M625 A NAME Method 625 Acid Compounds Date & Time Collected not specified

DATA FILE _5CB0258C05 CONC. FACTOR _____1

DATE EXTRACTED 02/26/86 DATE INJECTED 03/10/86

ANALYST MJL INSTRUMENT 5100 COMPOUNDS DETECTED G

VERIFIED BY LAK

NPDES SCAN EPA COMPOUND RESULT NPDES SCAN **EPA** COMPOUND RESULT 2.4.6-trichlorophenol ND | 11A 21A **7A** 58A 4-nitrophenol NB 88 22A 4-chloro-3-methylphenol <u>ND</u>: 2,4-dinitrophenol ND 59A 5A

2-chlorophenol ND : 24A 60A 2-methyl-4,6-dinitrophenol ND 1A 4A

64A 2,4-dichlorophenol <u>ND</u> ; 2A 31A 9A pentachlorophenol ND

34A 2.4-dimethylphenol <u>ND</u>! **3A** 65A 10A phenol ND

2-nitrophenol ND : 57A 6A

SURROGATE RECOVERIES

SCAN CODE COMPOUND RESULT d5-phenol 80 389 AS1 2-fluorophenol___81 285 AS2 987 AS3 2,4,6-tribromophenol 120 d3-phenol____ AS4

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram. All results reported in ug/l unless otherwise specified.

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Analytical Serv Results by Sample

LAB # 86-02-158 Continued From Above

SAMPLE ID Reagent Blank 625

TEST CODE M625 A NAME Method 625 Acid Compounds FRACTION 05A Date & Time Collected not specified Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84). BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. • CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

LAB # 86-02-158

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Analytical Serv REPORT Results by Sample

SAMPLE ID Reagent Blank 625	FRACTION <u>05A</u>	TEST CODE M625 B	NAME Method 625 Base/Neutrals
	Date & Time Col	lected not specifie	d Category

	VERIFIED COMPOUNDS DETECT	<u>WJL</u> 5100	LYST	ANA INSTRU	-		DATE EXTRACTED DATE INJECTED	5CB02	TA FILE FACTOR	
RESULT	COMPOUND		EPA	SCAN	NPDES	RESULT	COMPOUND	PA	SCAN E	NPDES
ND	itrosodimethylamine	N-n i	61B		41B	ND	acenaphthene	1 B		1 B
ND	itrosodiphenylamine	N-ni	62B		43B	ND	benzidine	5B		4B
ND	osodi-n-propylamine	N-nitro	63B		42B	ND	1,2,4-trichlorobenzene	88		46B
ND	thylhexyl)phthalate	bis(2-et	66B		13B	ND	hexachlorobenzene	98		338
ND	yl benzyl phthalate	buty	67B		1 5B	ND	hexachloroethane	28	1	36B
1	di-butyl phthalate		68B	1194	26B	ND	bis(2-chloroethyl)ether	88	1	11B
ND	i-n-octyl phthalate	d i	69B		29B	ND	2-chloronaphthalene	OB	ê	16B
ND	diethyl phthalate		70B		24B	ND	1,2-dichlorobenzene	25B	ā	20B
ND	dimethyl phthalate		71B		25B	ND	1,3-dichlorobenzene	26B	ē	21B
NE	nzo(a)anthracene A	ben	72B		5B	ND	1,4-dichlorobenzene	?7B	â	228
ND	benzo(a)pyrene		73B		6B	ND	3,3'dichlorobenzidine	8B	ē	23B
NE	o(b)fluoranthene *	benzo	74B		7B	ND	2,4-dinitrotoluene	15B	:	27B
ND	(k)fluoranthene *	benzo	75B		9B	ND	2.6-dinitrotoluene	6B	:	288
ND	chrysene A		76B		18B	ND	1,2-diphenylhydrazine	37B	3	29B
ND	acenaphthylene		77B		5 B	ND	fluoranthene	19B -	3	31B
ND	anthracene B		78B		ЗВ	ND	lorophenyl phenyl ether	OB 4-c	4	17B
	4.	•								

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Serv REPORT Results by Sample

LAB # 86-02-158
Continued From Above

SAMPLE ID	Reager	nt Blank 625	FRACT Date		TEST CODE		NAME <u>Method 625 Base/Neutrals</u> edCategory
14B	41B	4-bromophenyl phenyl	ether	ND	8 B	79B	benzo(ghi)perylene <u>ND</u>
128	42B	bis(2-chloroisopropyl)ether	ND	32B	вов	fluorene <u>ND</u>
10B	43B	bis(2-chloroethoxy)m	ethane	ND	44B	81B	phenanthrene B <u>ND</u>
34B	52B	hexachlorobut	adiene	ND	19B	82B	dibenzo(a,h)anthracene M
35B	53B	hexachlorocyclopent	adiene	ND	37B	83B	indeno(1,2,3-cd)pyrene ND
388	54B	isop	horone	ND	45B	84B	pyrene <u>ND</u>
39B	55B	napht	halene	<u>ND</u>			
40B	56B	nitrob	enzene	ND			

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
43	d5-nitrobenzene	BS1	504
51	2-fluorobiphenyl	BS2	766
23	d14-terpheny1	BS3	1342
	d10-biphenyl	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

* = benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPORT

LAB # 86-02-158

Continued From Above

SAMPLE ID Reagent Blank 625

FRACTION <u>O5A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>
Date & Time Collected <u>not specified</u> Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

Results by Sample

02 E-3ABN H2D

03 Reagent Blank H20 BNA

LAB # 86-02-171 PAGE 1 Analytical Serv RECEIVED: 02/24/84 03/20/86 12:11:33 PREPARED Radian Analytical Services REPORT Radian BY 8501 MoPac Blvd. TO B1. 4 Austin P. D. Box 9948 Austin, Texas 78766 CERTIFIED BY ATTEN Robert Wallace ATTEN PHONE (512) 454-4797 CONTACT GRIMSHAW SAMPLES 3 CLIENT LINCOLN COMPANY Lincoln Properties FACILITY Duplicate of report of 03/16/86. WORK ID 100 Congress Avenue TAKEN 2/25/86 Footnotes and Comments TRANS Fed Ex 736744452 TYPE H20 * Indicates a value less than 5 times the detection limit. P. D. # 229-025-06-20 Potential error for such low values ranges between 50 and 100%. INV. # 7531 @ Indicates that spike recovery for this analysis on the specific matrix was not within acceptable limits indicating an interferent present. SAMPLE IDENTIFICATION Analytical Serv TEST CODES and NAMES used on this report 01 1-2ABN H2D EX 625 Extraction only - 625 BN/A

M625 A Method 625 Acid Compounds

M625 B Method 625 Base/Neutrals

PAGE 2
RECEIVED: 02/26/86

Analytical Serv REF RESULTS BY TEST

LAB # 86-02-171

TEST CODE Sa
mplete (

LAB # 86-02-171 Analutical Serv RECEIVED: 02/26/86 Results by Sample TEST CODE M625 A NAME Method 625 Acid Compounds SAMPLE ID 1-2ABN H20 Date & Time Collected 02/25/86 Cateooru DATA FILE 5CU02171C01 DATE EXTRACTED 02/27/86 ANALYST VERIFIED BY LAK CONC. FACTOR ____1 DATE INJECTED 03/12/86 INSTRUMENT 5100 COMPOUNDS DETECTED 0 NPDES SCAN COMPOUND EPA RESULT NPDES SCAN EPA COMPOUND RESULT 11A 21A 4-nitrophenol ND 2.4.6-trichlorophenol ND : **7A** 58A **8A** 22A 4-chloro-3-methylphenol ND : 59A 2,4-dinitrophenol ND 2-chlorophenol ___ ND : 60A 2-methyl-4, 6-dinitrophenol ND 1 A 24A 4A 31A 2.4-dichlorophenol ND : **2A** 9A 64A pentachlorophenol ND 3A 34A 2.4-dimethylphenol ____ND : 65A 10A phenol ND 57A **6A** 2-nitrophenol ____ND : SURROGATE RECOVERIES SCAN CODE COMPOUND RESULT

NOTES AND DEFINITIONS FOR THIS REPORT.

378 AS1

277 AS2

971 AS3

AS4

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

d5-phenol___26%

d3-phenol_

2-fluorophenol___14%

2,4,6-tribromophenol 22%

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Analytical Serv

REPORT Results by Sample

LAB # 86-02-171 Continued From Above

SAMPLE ID 1-2ABN H20

FRACTION 01A Date & Time Collected 02/25/86

TEST CODE M625 A NAME Method 625 Acid Compounds

Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84). BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

40B 4-chlorophenyl phenyl ether

PAGE 5

17B

Analytical Serv

REPOR

LAB # 86-02-171

anthracene

RECEIVED: 02/26/86

Results by Sample

MEGET	IVED. U	2/20/0	00		π	620112 0	id gamh	16						-
SAMPL	E ID <u>1</u>	-2ABN	H20		•	ION <u>01A</u> & Time (CODE of O2/			Method 6 Cat	25 Base/ egory	Neut	rals
	ATA FILI		02144C01 1			02/27/6		ANA INSTRU	LYST MENT	MM 5100		VERIFI		
NPDES	SCAN	EPA		COMPOUND		RESULT	NPDES	SCAN	EPA		COMPOUND		R	ESULT
1 E	3	1B		acena	phthene	ND	: 41B		61B	N-n	itrosodim	ethylami	ne <u>-</u>	ND
4E	3	5B		b e	nzidine	ND	i 43B		62B	N-n	itrosodip	henylami	ne _	ND
46E	3	8 B	1,2,	4-trichloro	benzene	ND	1 1 42B		63B	N-nitr	osodi-n-p	ropylami	ne _	ND
338	}	9B		hexachloro	benzene	ND	1 13B	1505	66B	bis(2e	thylhexyl)phthala	te _	<u>1</u> J
36E	}	128		hexachlor	oethane	ND	1 15B		67B	but	ıl benzyl	phthala	te_	ND
11E	}	188	bis(2	2-chloroethy	1)ether	ND	: 26B		68B		di-butyl	phthala	te _	ND
16E	}	208	ā	2-chloronaph	thalene	ND	: 29B		69B	đ:	i-n-octy1	phthala	te	ND
208	}	25B	1	,2-dichloro	benzene	ND	: 24B		70B		diethyl	phthala	te _	ND
218	}	26B	1	.3-dichloro	benzene	ND	25B		71B		dimethyl	phthala	e	ND
228	1	27B	1	.,4-dichloro	benzene	ND	; 5B		72B	ber	izo(a)anti	racene	Α _	ND
238	.	28B	3, 3	dichlorobe:	nzidine	ND	6B		73B		benze	o(a)pyrer	1e _	ND
27B	}	35B		2,4-dinitro	toluene	ND	1 7B		74B	benzo	o(b)fluora	anthene	*	ND
28B	1	36B		2.6-dinitro	toluene	ND	! ! 9B		75B	benzo	(k)fluora	anthene	* _	ND
29B	}	37B	1,2	?-diphenylhy	drazine	ND	: : 18B		76B		ct	rysene	A _	ND
31B	1	39B		fluor	anthene	ND	! ! 2B		77B		acena	aphthyler	1e	ND
							ī							

3B

78B

PAGE 6 Analytical Serv REPORT LAB # 86-02-171 RECEIVED: 02/26/86 Results by Sample Continued From Above SAMPLE ID 1-2ABN H20 FRACTION 01A TEST CODE M625 B NAME Method 625 Base/Neutrals Date & Time Collected 02/25/86 Cateooru 4-bromophenyl phenyl ether ____ND : 14B 79B benzo(ghi)perylene ND 42B bis(2-chloroisopropyl)ether 12B 32B 80B fluorene ND bis(2-chloroethoxy)methane ___ 10B 44B 81B phenanthrene B ND **34B** 52B hexachlorobutadiene 19B 82B dibenzo(a,h)anthracene ___ 53B hexachlorocyclopentadiene 35B 37B **83B** indeno(1,2,3-cd)pyrene 38B 54B isophorone 45B 84B pyrene ND 39B 55B naphthalene <u>ND</u> ! 56B 40B nitrobenzene ND :

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
86%	d5-nitrobenzene_	BS1	489
84%	2-fluorobiphenyl_	BS2	750
92%	d14-terphenyl_	BS3	1352
	d10-biphenyl	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ___uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

= benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-171

Continued From Above

SAMPLE ID 1-2ABN H2D

FRACTION <u>01A</u>

TEST CODE M625 B

NAME Method 625 Base/Neutrals

Date & Time Collected 02/25/86 Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

PAGE B	
RECEIVED:	02/26/86

Analytical Serv

REPORT

LAB # 86-02-171

Results by Sample

SAMPLE ID E-3ABN H20

FRACTION <u>O2A</u> TEST CODE <u>M625 A</u> NAME <u>Method 625 Acid Compounds</u>
Date & Time Collected <u>O2/25/86</u> Category

DATA FILE <u>5CU02171C02</u> CONC. FACTOR 1

DATE EXTRACTED 02/27/86
DATE INJECTED 03/12/86

2-nitrophenol ND :

ANALYST MM INSTRUMENT 5100 VERIFIED BY LAK
COMPOUNDS DETECTED 0

NPDES SCAN EPA COMPOUND RESULT NPDES SCAN EPA COMPOUND RESULT 2.4.6-trichlorophenol ____ND : 11A 21A **7A** 58A 4-nitrophenol ND 4-chloro-3-methylphenol ND | 84 22A 59A 2.4-dinitrophenol ND 5A 24A 2-chlorophenol ND : 1A 60A 2-methy1-4,6-dinitrophenol ND 44 2A 31A 2.4-dichlorophenol ND : 64A pentachlorophenol ND 3A 34A 2.4-dimethylphenol ND : 10A 65A phenol ND

SURROGATE RECOVERIES

6A

57A

 SCAN CODE
 COMPOUND
 RESULT

 375
 AS1
 d5-phenol
 64%

 270
 AS2
 2-fluorophenol
 58%

 970
 AS3
 2,4,6-tribromophenol
 97%

 AS4
 d3-phenol

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.

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RECEIVED: 02/26/86

Analytical Serv

REPORT

Results by Sample

LAB # 86-02-171

Continued From Above

SAMPLE ID E-3ABN H20

FRACTION 02A

TEST CODE M625 A NAME Method 625 Acid Compounds Date & Time Collected 02/25/86

Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84). BL = detected in reagent blank; background subtraction not performed. J = estimated value; less than method detection limit. CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-171

RECEIVED: 02/26/86

Results by Sample

SAMPLE ID <u>E-3ABN H20</u> FRACTION <u>O2A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>O2/25/86</u> Category

					==:							
_		VERIFIED POUNDS DETEC		LYST	ANA INSTRU	_		DATE EXTRACTED DATE INJECTED	<u>J02171C02</u> 1		TA FIL FACTO	
ŗ	RESUL	4D	COMPOUND	EPA	SCAN	NPDES	RESULT	COMPOUND	CDM	EPA	SCAN	NPDES
<u>}</u>	. 14	imethylamine	N-nitrosodim	61B		41B	<u>ND</u>	acenaphthene		1 B		1 B
į	11	iphenylamine	N-nitrosodip	62B		43B	ND	benzidine		5 B		4B
<u> </u>	N	-propylamine	N-nitrosodi-n-p	63B		428	ND	4-trichlorobenzene	1, 2, 4-t	88		46B
ž	1/3	;l)phthalate	bis(2-ethylhexyl	66B		13B	ND	hexachlorobenzene	h e	9B		338
<u>}</u>	N	ıl phthalate	butyl benzyl	67B		15B	ND	hexachloroethane	, h	12B		36B
į	1_	ıl phthalate	di-butyl	68B	1178	26B	ND	?-chloroethyl)ether	bis(2-ch	18B		11B
<u> </u>	N	l phthalate	di-n-octyl	69B		29B	ND	2-chloronaphthalene	2-ch	20B		16B
· ·	<u> </u>	l phthalate	diethyl	70B		24B	ND	,2-dichlorobenzene	1,2-	25B		208
<u> </u>	N	1 phthalate	dimethyl	71B		25B	ND	,3-dichlorobenzene	1,3-	26B		218
1	<u> </u>	nthracene A	benzo(a)anti	72B		5B	ND	,4-dichlorobenzene	1,4-	27B		22B
: •	<u>N</u>	nzo(a)pyrene	benza	73B		6B	ND	dichlorobenzidine	3,3'di	28B		23B
-	141	ranthene *	benzo(b)fluora	74B		7B	<u>ND</u>	2,4-dinitrotoluene	. 2,4	35B		27B
:	141	ranthene *	benzo(k)fluora	75B		9B	<u>ND</u>	2,6-dinitrotoluene	2, 6	36B		288
	<u> </u>	chrysene A	ct	76B		18B	<u>ND</u>	-diphenylhydrazine	1,2-di	37B		29B
:	N	naphthylene	acena	77B		28	ND	fluoranthene		39B		31B
	141	thracene B	anti	78B		ЗВ	ND	henyl phenyl ether	4-chlorophen	40B		17B

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Serv REPORT Results by Sample LAB # 86-02-171 Continued From Above

SAMPLE 1	ID <u>E-3abi</u>	N H20	FRACT Date			CODE <u>M625 B</u> 1 02/25/B6	NAME <u>Method 625 Base/Neutrals</u> Category
14B	41B	4-bromophenyl phenyl	ether	ND	: 8B	79B	benzo(ghi)perylene <u>ND</u>
12B	42B	bis(2-chloroisopropyl	ether	ND	328	808	fluorene <u>NE</u>
1 O B	43B	bis(2-chloroethoxy)m	thane	ND	448	81B	phenanthrene B <u>ND</u>
34B	52B	hexachlorobuta	adiene	ND	19B	82B	dibenzo(a.h)anthracene <u>ND</u>
35B	53B	hexachlorocyclopenta	adiene	ND	37B	838	indeno(1,2,3-cd)pyrene ND
388	54B	isopt	norone	<u>ND</u>	45B	848	pyrene ND
398	55B	naphti	nalene	ND	i 		
40B	56B	nitrobe	enzene	ND	; ;		

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
106	d5-nitrobenzene_	BS1	488
112	2-fluorobiphenyl	BS2	749
114	d14-terphenyl_	BS3	1325
	d10-biphenul	BS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in uq/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

= benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-171 Continued From Above

SAMPLE ID E-3ABN H2D

FRACTION 02A

TEST CODE M625 B

NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected 02/25/86 Category

B = anthracene and phenanthrene co-elute in high concentrations.

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-171

RECEIVED: 02/26/86

Results by Sample

SAMPLE ID <u>Reagent Blank H2O BNA</u> FRACTION <u>O3A</u> TEST CODE <u>M625 A NAME Method 625 Acid Compounds</u>

Date & Time Collected <u>not specified</u> Category

DATA FILE <u>5CU02171C03</u>
CONC. FACTOR _____1

DATE EXTRACTED 02/27/86
DATE INJECTED 03/12/86

 VERIFIED BY LAK

COMPOUNDS DETECTED 0

1								
RESULT	COMPOUND	EPA	NPDES SCAN	RESULT	COMPOUND	EPA	SCAN	NPDES
ND .	4-nitrophenol	58A	7A	ND	2,4,6-trichlorophenol	21A		11A
ND	2,4-dinitrophenol	59A	5A	ND	4-chloro-3-methylphenol	22A		ВА
ND	2-methy1-4,6-dinitrophenol	60A	4A	ND	2-chlorophenol	24A		1A
ND	pentachlorophenol	64A	9A	ND	2.4-dichlorophenol	31A		2A
ND	phenol	65A	10A	ND	2,4-dimethylphenol	34A		AE
				ND	2-nitronhanol	57A		44

SURROGATE RECOVERIES

RESULT	COMPOUND	CODE	SCAN
d5-pheno1 <u>79%</u>	•	AS1	<u>375</u>
luorophenol <u>76%</u>	2-f	AS2	272
romophenol <u>146%</u>	2,4,6-tri	EZĄ	969
d3-ohenol		AS4	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.
All results reported in ug/l unless otherwise specified.

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Analytical Serv

REPORT

LAB # 86-02-171

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Results by Sample

Continued From Above

SAMPLE ID Reagent Blank H20 BNA

FRACTION <u>03A</u>

TEST CODE M625 A NAME Method 625 Acid Compounds

Date & Time Collected not specified

Category

ND = not detected at EPA detection limit method 625, (Federal Register, 11/26/84).

BL = detected in reagent blank; background subtraction not performed.

J = estimated value; less than method detection limit.

CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

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Analytical Serv

REPORT

LAB # 86-02-171

RECEIVED: 02/26/86

Results by Sample

SAMPLE ID <u>Reagent Blank H2O BNA</u> FRACTION <u>O3A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>not specified</u> Category

				<u></u>	0 V 3 D C C .	1110		
	TA FILE 50 FACTOR	UO2171CO3 DATE EXTRACTED DATE INJECTED			NALYST . RUMENT .		VERIFIE COMPOUNDS DETE	ED BY LAK
NPDES	SCAN EPA	COMPOUND	RESULT	NPDES SCA	N EPA	COM	POUND	RESULT
1 B	1 E	acenaphthene	ND	418	61B	N-nitros	sodimethylamin	ne <u>NE</u>
4B	5E	benzidine	ND	43B	62B	N-nitros	sodiphenylamin	ne <u>ND</u>
46B	88	1,2,4-trichlorabenzene	ND	428	63B	N-nitrosod:	i-n-propylamin	ne <u>ND</u>
338	98	hexachlorobenzene	ND	13B	66B	bis(2-ethyl	nexyl)phthala	te <u>ND</u>
36B	128	hexachloroethane	ND	15B	67B	butyl be	enzyl phthalat	te <u>ND</u>
11B	188	bis(2-chloroethyl)ether	ND	26B	68B	d i – t	outyl phthalat	te <u>ND</u>
16B	208	2-chloronaphthalene	<u>ND</u>	29B	69B	di-n-c	octyl phthalat	te <u>ND</u>
208	25B	1,2-dichlorobenzene	ND	24B	70B	di∈	ethyl phthalat	te <u>ND</u>
218	26B	1,3-dichlorobenzene	ND	25B	71B	dime	thyl phthalat	te <u>ND</u>
228	27B	1,4-dichlorobenzene	<u>ND</u>	5B	72B	benzo(a	a)anthracene	A ND
23B	288	3,3'dichlorobenzidine	ND	6 B	73B		benzo(a)pyren	ne <u>ND</u>
27B	35B	2,4-dinitrotoluene	ND	7B	74B	benzo(b)f	luoranthene	* <u>ND</u>
288	36B	2,6-dinitrotoluene	<u>ND</u>	9B	75B	benzo(k)f	luoranthene	* <u>ND</u>
29B	37 B	1,2-diphenylhydrazine	ND	18B	76B		chrysene	A <u>ND</u>
31B	39B	fluoranthene	ND	2B	77B		acenaphthylen	ie <u>NB</u>
17B	40B	4-chlorophenyl phenyl ether	<u>ND</u>	ЗВ	78 B		anthracene	B ND

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Analytical Serv

Serv REPORT Results by Sample

LAB # 86-02-171 Continued From Above

SAMPLE ID Reagent Blank H20 BNA FRACTION 03A TEST CODE M625 B NAME Method 625 Base/Neutrals Date & Time Collected not specified Categoru 14B 41B 4-bromophenyl phenyl ether ____ND : 79B benzo(ghi)perylene ____ND 42B bis(2-chloroisopropyl)ether ND { 12B 32B **80B** fluorene ND bis(2-chloroethoxy)methane ____ND : 10B 44R 81B phenanthrene B <u>ND</u> 52B 34B hexachlorobutadiene ND : 19B 82B dibenzo(a,h)anthracene ND 35B **53B** hexachlorocyclopentadiene indeno(1,2,3-cd)pyrene 37B 83B 54B 38B isophorone ND; 45B 84B pyrene ND 39B 55B naphthalene ND: 54B 40B nitrobenzene ND :

SURROGATE RECOVERIES

	RESULT	CODE	SCAN
102	d5-nitrobenzene_	BS1	488
104	2-fluorobiphenyl_	BS2	749
128	d14-terphenyl_	883	1324
	d10-highenul	DC/	

NOTES AND DEFINITIONS FOR THIS REPORT.

SCAN = scan number or retention time on chromatogram.

All results reported in ug/l unless otherwise specified.

ND = not detected at EPA detection limit method 625, (Federal Register, 10/26/84).

= benzo(b)fluoranthene and benzo(k)fluoranthene co-elute.

A = benzo(a)anthracene and chrysene co-elute in high concentrations.

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Analytical Serv

REPORT

Results by Sample

LAB # 86-02-171 Continued From Above

SAMPLE ID <u>Reagent Blank H2O BNA</u> FRACTION <u>O3A</u> TEST CODE <u>M625 B</u> NAME <u>Method 625 Base/Neutrals</u>

Date & Time Collected <u>not specified</u> Category

B = anthracene and phenanthrene co-elute in high concentrations.
BL = detected in reagent blank; background subtraction not performed.
J = estimated value; less than method detection limit.
CONC. FACTOR: indicates dilution of sample if greater than one (1). Minimum detection limits should be multiplied by conc. factor.

CORPORATI	· O N		i 💛		· · · · · · · · · · · · · · · · · · ·
PAGE 1	Analytica	1 Sarv	REPORT		LAB # 86-02-155
	uliathetre				CUD # OG OF 199
RECEIVED: 02/25/86		03/21/	B6 11:30:15		
					· · · · · · · · · · · · · · · · · · ·
REPORT <u>Radian</u>			Radian Analytical S	ervices	
TO <u>B1. 4</u>		BY	8501 MoPac Blvd.	~ 	
Austin			P. O. Box 9948		family the
•			Austin, Texas 78766	<u> </u>	CERTIFIED BY
ATTEN Robert Wallace		ATTEN		-· 	·
		PHONE	(512) 454-4797		CONTACT GRIMSHAW
CLIENT LINCOLN	SAMPLES <u>6</u>				
COMPANY <u>Lincoln Properti</u>	es				
FACILITY					
			showed interference		
		BOD data	received by phone f	rom Aqua	alab.
WORK ID 100 Congress Av.					
TAKEN WH, JM			,		
TRANS WH	····		Footnotes and C	<u>omments</u>	
TYPE	·				
P. D. # <u>229-025-06-20</u>					s the detection limit.
INVOICE <u>under separate c</u>	OVET	Potentia	<u>l error for such lou</u>	<u>values</u>	ranges between
		50 and 1	<u>00%.</u>		
					this analysis on the
		specific	matrix was not with	<u>in accep</u>	table limits indicating
		an inter	ferent present.		
SAMPLE IDENTIFICATION	Analut	ical Serv	v TEST CODES and NAM	FS used	on this report
01 I1		Silver			Nickel, ICPES
02 E1			low level		Lead, low level
03 E2		Barium,			Total Phenolics
04 R1			cal Oxygen Demand		
04 B1 05 I2 06 E3	B F	Boron	TOPES	SETS A	Settleable Solids
04 F3	CD F	<u>Cadmium</u>	TCPES		Selenium, low level
<u> </u>		Formald		SO4 IC	Sulfate IC
		Chlorid			Total Dissolved Solids
	CNTOTA	Total C	uanida		Total Phosphate
			1 Oxygen Demand	T55 A	
	CR E		n. ICPES	ZN E	Zinc, ICPES
	CUE			<u> </u>	EARCH AUT CO
			on by Method 3020		
			on by Method 6010		
			Cold Vapor		
	MN E		se, ICPES		
	<u> </u>		TEL AVI LU		

PAGE 2 RECEIVED: 02/25/86

REPORT

LAB # 86-02-155

Analytical Serv REPORESULTS by Sample

SAMPLE ID II			FRACTIONS: A, B, C Collected 02/24/8		in Til
		pave & iline	COLLECTED VEIETICE	<u> </u>	
AG_E 0.002*	AS_GA 0.012*	BA_E <u>0.18</u>	BOD5 12	B E . 0.28	CD_E <u>0.11</u>
		CNTOTA 0.09	COD A <5		·CU_E 0,008
DG3020 03/06/86		•	•	` '.	PB GA 0.002*
	date complete	ug/m1	ug/ml	vg/m1	ug/m1
PHEN_A 0.010*	PH A 8.80	SETS_A C1	SE_GA	504_IC 240 mg/L	TDS_A 720
	TSS_A 17				
SAMPLE ID E1		SAMPLE # 02	FRACTIONS: A.B.C.	D, E, F, G	
		Date & Time	Collected 02/24/8	<u>6</u> Categ	ory
AG_E <u>(.002</u>	AS_GA 0.10*	BA E 0.053	BOD5 3	B_E(.05	CD_E <u>C. 002</u>
			COD_A <5		CU_E <.001
DG3020 03/06/86	DG6010 03/18/86		MN_E 0.022		PB_GA 0.003%
•	•		SE_GA (.003	-	
mu/L	hii 611762	101 A 7 L		my/L	my r 🖛













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Serv REPORT Results by Sample

LAB # 86-02-155 Continued From Above

SAMPLE ID E2		SAMPLE # 03 Date & Time	FRACTIONS: A, B, C Collected 02/24/8	G, D, E, F, G B6 Cate	qory
: AG_E <u>0.002*</u>	AS_GA 0.027	BA E 0.055	BOD5 4	B E < . 05	CD_E(, 002
: CH20	_	-	COD A 15		CU_E0.004*
DG3020 03/06/86 date complete	DG6010 03/18/86	HG_CA(.0002	MN_E 0.024	NI_E 0.044	
PHEN_A 0.008*	PH A 8.71	SETS_A (1	SE_GA(.003	SO4_IC 220	TDS_A 590
TP04 A 0.13	TSS_A 6	ZN_E 0.010*	-	-	-

SAMPLI	E ID B1		SAMPLE # 04 Date & Time	FRACTIONS: A, B, C Collected 02/24/8		jory
AG_E_	0.006* ug/m1	AS_GA < 003	BA E 0.001*	BOD5 8	B_E	CD_E <u>(.002</u>
CH50 ⁻	0.15 mg/L	CL_IC(1_mg/L	CNTOTA C. 01	COD_A 15	CR_E (.005	CU_E





PAGE 4 RECEIVED: 02/25/86

Analytical Serv REPO Results by Sample

REPORT

LAB # 86-02-155 Continued From Above

1 1 1 1	003020 03/06/86 date complete	DG6010 03/18/86 date complete	HG_CA <.0002	MN_E 0.021	NI_E <.003	PB_GA 0.002*
	PHEN_A C. 005	PH_A 8.82	SETS_AC1_	SE_GA < . 003@	SO4_IC <1	TDS_A C1
	TPO4 A C. 02 mg/L as P	TSS_A 3*	ZN E (.003	,	. *	

SAMPLE ID 12		SAMPLE # <u>05</u> Date & Time	FRACTIONS: A, B, C, D, E, F, G Collected 02/25/86		Category		
AG_E 0.004*	AS_GA 0.008*	BA E 0.061	BOD5 9	B_E	0, 24% ug/m1	CD_E	<.002 ∪g/m1
CH20 0.42	CL_IC	CNTOTA 0.07	COD_A 21	CR_E	0.007* ug/m1	CV_E	0.009 ug/m1
DG3020 03/06/86 date complete	DG6010 03/18/86 date complete	HG_CA(.0002	MN_E 0.043	NI_E	0.009* ug/m1	PB_GA	0.008 ug/m1
PHEN A 0.029	PH_A 8.22	SETS_A(1	SE_GA <u>C. 003</u>	S04_IC	250 mg/L	TDS_A	660 mg/L
TPO4_A0.03* mg/L as P	TSS_A 38	ZN E 0.032					

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Analytical Serv REPORT Results by Sample

SAMPLE ID E3		SAMPLE # <u>06</u> Date & Time	FRACTIONS: A.B.C Collected 02/25/8	, D, E, F, G 16	Categor	`¥ ¥'	
AG_E 0.005*	AS_GA 0.010*	BA_E 0.061	BOD5 7	B_E	<.05 ug/ml (002 g/ml
CH20 0.25	CL_IC 80	CNTOTA C. 01	COD_A 13	CR_E	0.006* (002*
DG3020 03/06/86 date complete	DG6010 03/18/86	HG_CAC.0002	MN_E 0.024	NI_E	<.003 f		008 g/ml
PHEN A C. 005	PH_A 8.58	SETS_A	SE_GA <u>C. 003</u>	S04_IC	240 mg/L	rds_a	780 mg/L
TP04_A 0.05*	TSS_A 12	ZN E 0.016					i 1 1 1